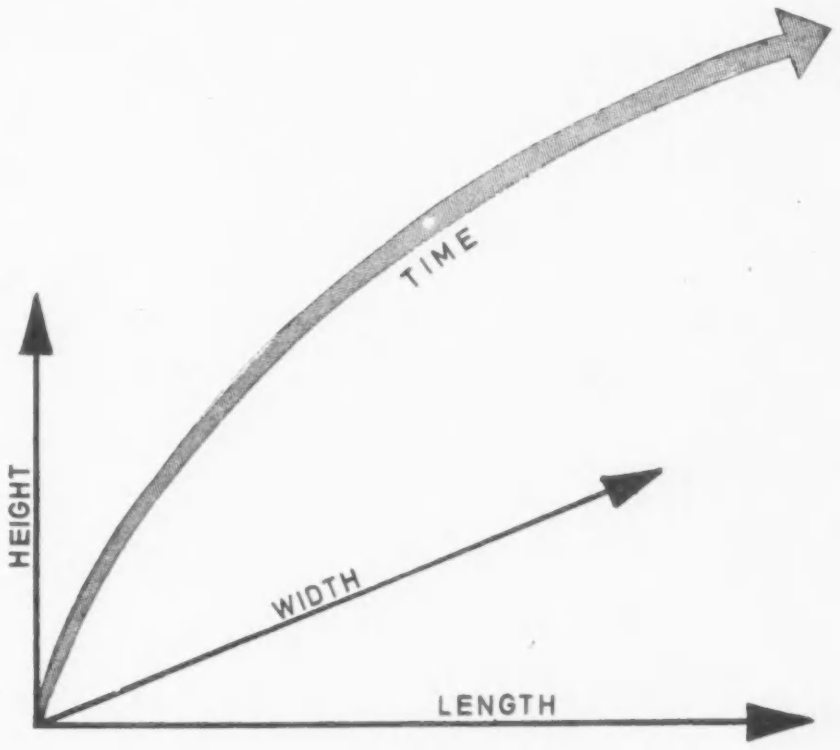
Serial Dept.

EKISTICS

ABSTRACTS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

JUNE · 1960



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E K I S T I C S

ABSTRACTS

of

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Published By

DOXIADIS ASSOCIATES
Consulting Engineers
24, Strat. Syndesmou
ATHENS, GREECE

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EKISTICS is compiled by Mrs. Gwen Bell under the direction of Prof. J. Tyrwhitt.

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EDITORIAL

The articles abstracted this month reflect three separate themes which play significant parts of the study of ekistics. (1) The growth of cities and towns provides the context in which human settlements are established. (2) The provision of housing to suit the needs of people, technology, and climate is perhaps one of the most significant contributions of the science of ekistics in the building of settlements. (3) Finally, development programming, a relatively recent technique for establishing priorities, is of importance in setting the establishment of settlements within the wider context of national, regional, or local needs and their possible effect upon other aspects of the life of the area.

THE GROWTH OF CITIES AND TOWNS

The city of Khartoum is outlined in its development without the benefits of overall planning. In this case, the various forces which brought about certain directions and patterns are pointed out. In contrast, the future of what Gordon Cullen calls "IXth Delhi" is shown developing from a series of planning efforts to create a city. Gordon Cullen has retained some of the ideas in the past plan and re-used them to build up a modern, vital city.

Today, the "new town in the wilderness" is rare; more common care "new towns" which actually form part of existing large metropolitan areas. In Canada, a country where there are both large metropolis and still vast areas of semi-wilderness, there are striking examples of both kinds of new towns. Elliot Lake is a town shaped out of the wilderness to meet the needs of a new uranium mine, while Don Mills is a successful and interesting new town which forms part of the Toronto metropolitan area. In strong contrast to Elliot Lake are the new oil towns in the wilderness of Iran's oil bearing deserts described by Jane Drew.

HOUSING TO SUIT THE NEEDS OF PEOPLE, TECHNOLOGY AND CLIMATE

Advancing technology has allowed the satisfaction of needs of people and climate to a much greater degree than was formerly thought possible. In Building Research Centers throughout the world, new techniques are constantly being brought forth and tested to help man live more comfortably. This month, EKISTICS has abstracted an article which presents new possibilities for the design of window and ventilator openings in warm and humid climates, that allow breezes to enter but keep out rain or insects.

Technology has also had a pronounced affect on the design of groups of housing units--particularly in regard to the demand to accommodate both automobiles and humans within the living area. James A. Murray presents a well illustrated survey of the problems which this causes and some possible ways of accommodating both successfully. A concrete example, is then provided in a new housing group being built in Venice by the Gardella group. Here the automobile, the person, and the characteristics of housing peculiar to the culture are all accommodated within a single design unit.

On a large scale, the evaluation of total needs of housing in both cities and countries is a crucial problem. Surveys of the need and approach to solutions for New Jerusalem and India have been abstracted. These both relate the actual planning and layout of housing groups to the overall development programming for the city or nation. On an infinitely smaller scale is a report of housing rehabilitation on the arctic circle: the Beaver Report.

DEVELOPMENT PROGRAMMING

The need for development programming has arisen with the desire for development by the many countries in the world which are still for the most part at the beginning of the handicraft to technological revolution. In desiring to maximize the speed of change, it is necessary to choose the best of all possible ways in which to expend the limited capital and skilled labor. Two statistical approaches to the assessment of the available and future supply of technical personnel have been abstracted from the International Labor Review and the Regional Centre for Demographic Training and Research in South America. A more elaborate technique called "development programming" is then described. This system is just starting to get under way in many countries and can help in the formulation of policies regarding everything from education to foreign trade and the exploitation of mineral resources. Two very interesting reports on "development programming" by groups of U.N. experts follow: the first with the needs of the African countries, the second, a more sophisticated approach related to the ECAFE nations.

Hamdan, G.
THE GROWTH AND FUNCTIONAL STRUCTURE OF KHARTOUM
Geographical Review, January, 1960. Pages 21-40. Illustrations.
711.424 (62)

1. Dr. Hamdan, lecturer in geography, Cairo University, presents a thoughtful study of the development of a city which is quite unique. Although the site of Khartoum has been occupied since ancient times, the city itself is recent, coeval with many cities of the American Midwest. It was founded by Mohammed Ali about 1820 as a permanent military camp. About 1830, because of the obvious advantages of its situation at the confluence of the Blue and White Niles at the approach to the inhabited area south of the forbidding Nubian Desert, Khartoum was selected as the seat of Egyptian rule in Sudan. However, it was still small in comparison with Shendi, Sennar, and Wad Medani, the chief urban centers of the Sudan at the time. The history of Khartoum is one of ups and downs, punctuated with numerous plagues and recurrent depopulation. By 1840 its population was estimated at 30,000, in 1846 it was about 60,000, but it fell to 30,000 in 1862 and to 20,000 in 1870. Indeed, the seat of government was occasionally moved to Shendi during severe plagues. The town was an unplanned agglomeration of dirty mud buildings interspersed with native thatched huts. In 1885-1886 it was sacked and utterly devastated by the Mahdists, who set up their capital in Omdurman, on the opposite bank of the White Nile. With the reconquest of the Sudan by Kitchener in 1898, the story of the second Khartoum began. The town was laid out, for military reasons, in the form of a series of Union Jacks, largely unrecognizable now. Omdurman, also, had suffered some devastation, traces of which are still visible. About the same time, the smaller town of Khartoum North, on the Blue Nile opposite Khartoum, began to develop as the state arsenal and storehouse. Such was the inception of the "Triple Capital" --a veritable Nilotic "Tripolis." (See Fig. 1, page 394).

2. The Growth of Khartoum. Since the beginning of the second Khartoum, growth is easily divisible into three phases: (1) the nuclear period, from the turn of the century to World War I; (2) the formative period, tentatively but conveniently delimited as the interwar period; and (3) the explosive period, largely the postwar years. From 1898 to 1914 the modest outermost limits of Khartoum fell considerably short of coinciding with the surrounding rail ring. Then in the formative period, 1914-1939, growth consisted mainly in the filling in of the gaps in the existing built-up area.

3. The third phase of Khartoum's growth, the explosive period, accounts for the greater part of the built-up area. Mushrooming crazily, the city fast outstripped the rail loop, and a completely new town, Khartoum South Sprang up. Today, Khartoum covers a total area of some seven square miles. By far, the greater part

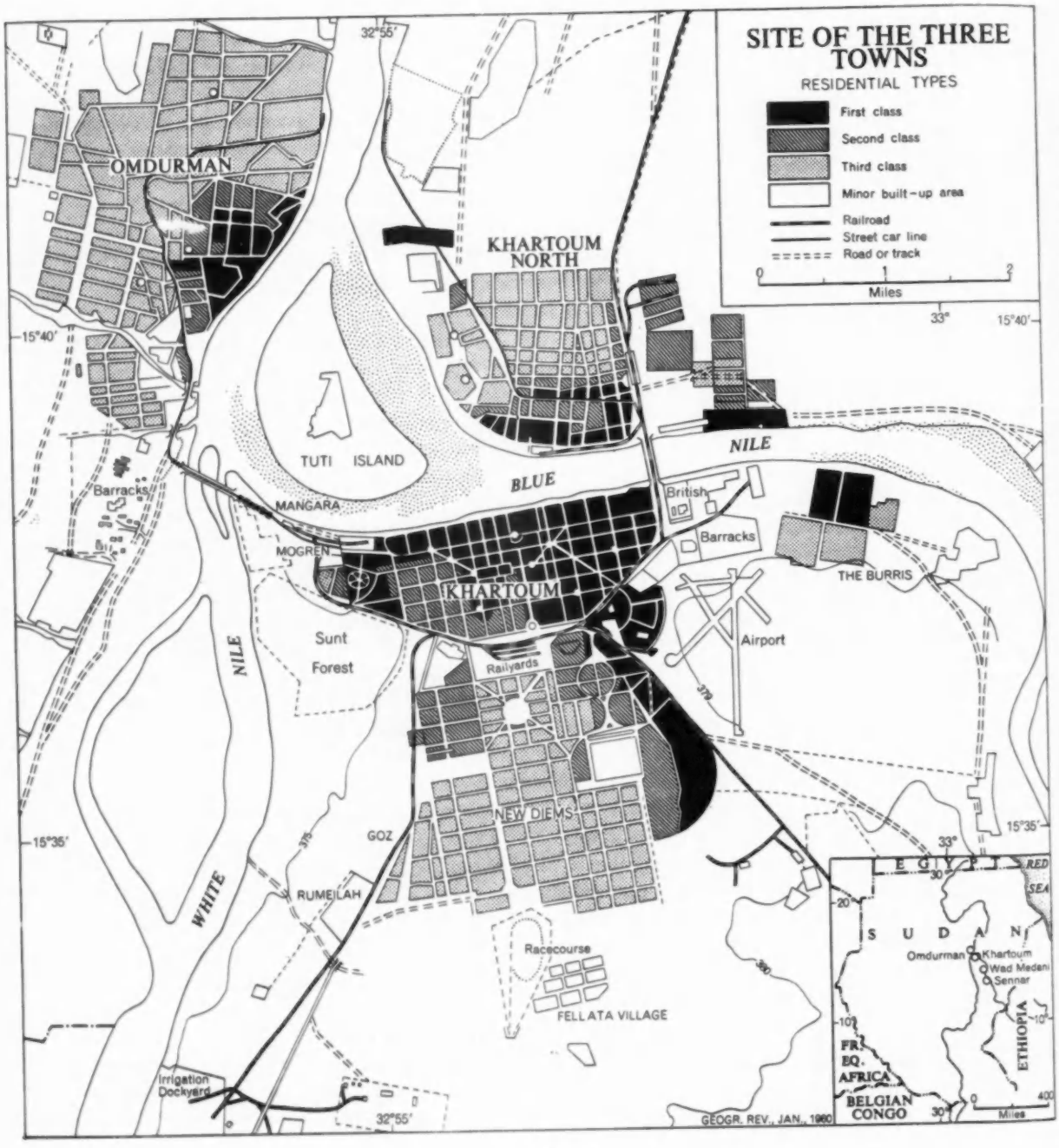

SITE OF THE THREE TOWNS
RESIDENTIAL TYPES
First class
Second class
Third class
Minor built-up area
Railroad
Street car line
Road or track
0 1 2
Miles
OMDURMAN
KHARTOUM NORTH
KHARTOUM
TUTI ISLAND
BLUE
NILE
WHITE NILE
MANGARA
MOGREN
Barracks
British Barracks
THE BURRIS
Airport
Railyards
Sunt Forest
NEW DIEMS
GOZ
RUMEILAH
Racecourse
FELLATA VILLAGE
Irrigation Dockyard
32°55'
33°
15°40'
15°35'
GEOGR. REV., JAN., 1960
EGYPT
RED SEA
SUDAN
Omdurman
Khartoum
Wad Medani
Sennar
ETHIOPIA
FR. EQ. AFRICA
BELGIAN CONGO
Miles

FIG. 1

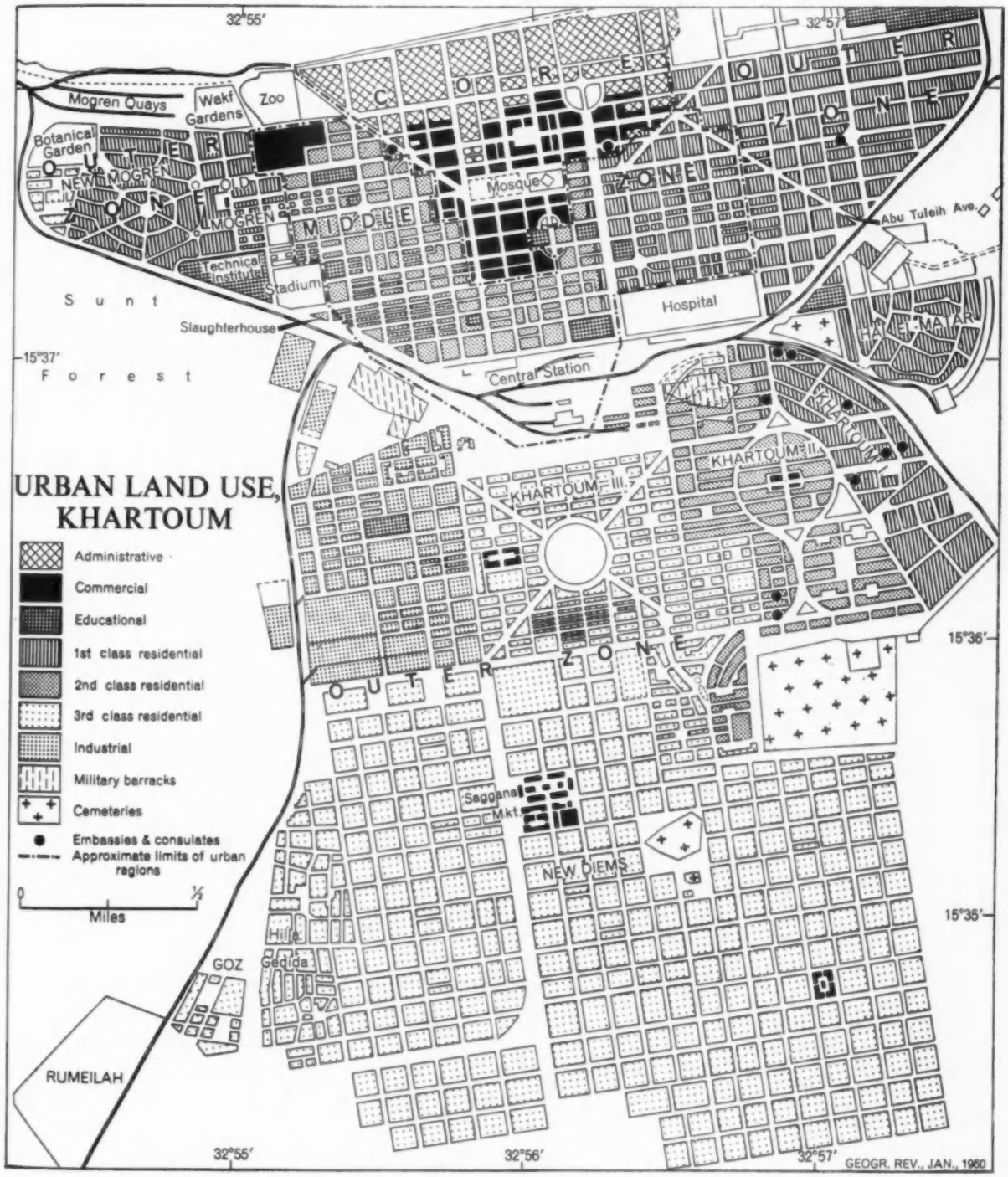

URBAN LAND USE, KHARTOUM
Administrative
Commercial
Educational
1st class residential
2nd class residential
3rd class residential
Industrial
Military barracks
Cemeteries
Embassies & consulates
Approximate limits of urban regions
0
½
Miles
32°55′
32°57′
32°56′
15°37′
15°36′
15°35′
Mogren Quays
Wakf Gardens
Zoo
Botanical Garden
OUTER ZONE
MOGREN
NEW MOGREN
OLD MOGREN
MIDDLE ZONE
CORE ZONE
Mosque
Technical Institute
Stadium
Hospital
Abu Tuleih Ave.
HALF-MAYAR
Slaughterhouse
Central Station
Sunt Forest
KHARTOUM III
KHARTOUM II
KHARTOUM I
OUTER ZONE
Saggana Mkt.
NEW DIEMS
Hills
GOZ
Gedida
RUMEILAH
GEOGR. REV., JAN., 1960

FIG. 2

of the population, so long entrenched within the rail loop, now lives outside it--84,080 in 1956, as against not quite 15,330 within the loop. The factors behind this rapid expansion lie in the growth of light industry, fostered by the war; in Khartoum's enhanced political role, which has given rise to an inflated officialdom in the capital; and in the drift of immigrants from the provinces.

4. Khartoum is characterized by a horizontal sprawl of one-story structures and gives the impression of a vast suburb. Part of the reason for this is the absence of a water-borne sewerage system. But the out-of-doors mode of life in the tropics is in itself enough to make the villa type of house the norm and it it not likely that Khartoum will be transformed into a compact, multistoried city when a sewerage system is installed.

5. Directors of Growth. The nucleus of each of the Three Towns originated along the water front. They then steadily grew away from it. This has progressively aggravated the disorientation, physical distance, and severance between the Three Towns. Growth has been concentric, with Tuti Island roughtly at the center. This annular growth, however has not been symmetric but selective, proceeding actively along certain lines, more slowly along others. Such differentials can be attributed to the controls of site configuration or of certain man-made obstacles. With the explosive period there arose serious obstacles to growth, due to the existing land-use pattern. Khartoum was encircled by an "iron curtain" consisting of the rail loop, the airport, and a series of formidable army barracks at the strategic entrances to the Three Towns.

6. Westward the exceptionally low level of the land, with its liability to flooding and swampiness, remains a serious handicap. Only the northwestern tip has been developed, in spite of difficulties and expense because of its key position as the only route to Omdurman. Southward obstructions to growth were the rail ring, airport, cemeteries, and the "Old Deims" (separate settlements of hovels for construction workers in the early days of the second Khartoum). With the demolition of the deims, the city swept across the rail ring in a robust tidal wave of population, to form the so-called Kartoums I, II, and III and the "New Deims." (See Figure 2, page 395). Khartoum has thus come to have a north-south axis and has assumed a T shape. The planning validity of this southerly trend is doubtful, since Khartoum South, despite the planted mesquite-forest "green belt" and the anti-rain embankment, suffers from two drawbacks: it is exposed both to the devastating autumn torrents and to the violent winds and sandstorms of the haboob. The piecemeal nature of its growth thwarts town planning and leads to a chronic clash between urban and rural interests.

7. The Functional Structure of Khartoum. Functionally, the core of Khartoum combines the business, administration, and communication centers. All sorts of merchandising are compactly and rigidly aggregated here by zoning. This hub shows a large measure of stability on maps of successive periods. Business offices, company headquarters, banks, professional offices, hotels, agencies, and shops occupy the nucleus. Around this is a

FIG. 3—Western limit of the old Mogren. To the left are the three-storied Egyptian education buildings; to the right is the vast, flat colony of police living quarters.

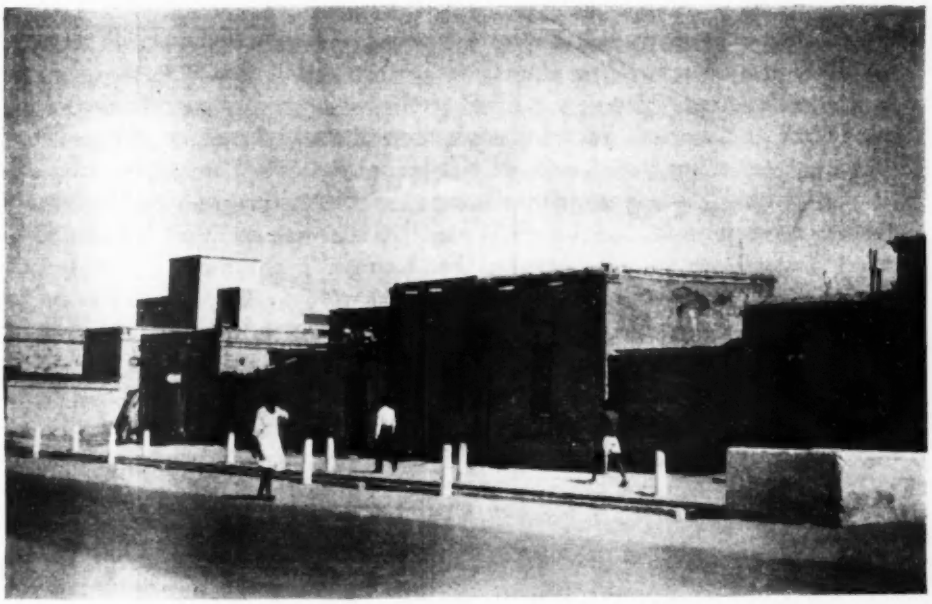


FIG. 4—Poor housing in Khartoum III. There is an open drain on the right-hand side of the street.

ring of wholesale stores and depots. In most cities a ring of light industry follows, but here zoning regulations, together with the horizontal sprawl of the city, have resulted in a unique duplication--yet another ring of retain shops of the "neighborhood" type serving the wide-flung peripheral residential mass, which because of zoning regulations has been deprived of commercial subcenters.

8. The business center has both a European and an Arab market, a duality reflecting the heterogeneity of its cosmpolitan population. To the north of the spacious main square with its central mosque, is the European market, clearly dominated by foreign businessmen, mainly Europeans but also Levantines and Egyptians. The Arab market lies to the south of the square. The strict localization of each type of product and of each group of trades provides a contrast to the European market.

9. The core is the only place in the city, indeed in the Three Towns, which exceeds one story in height, being two-storied on the average, with a few recent three-storied buildings. Its vertical density of building is accompanied by an absence of open spaces and gardens, except in the administrative development along the Nile.

10. The middle zone is plainly visible in Khartoum, hemming in the core from all sides except along the Blue Nile. It is dominated by residential and educational functions. Population density is high and wide tracts show signs of blight--shabby, crumbling structures, deserted and derelict gaps. The area abounds in ethnic minorities and foreign elements. The strong concentration of educational institutions include private schools, schools of the foreign communities and the Christian missionaries and Coptic Egyptian schools.

11. The outer zone is the most extensive of the three zones of Khartoum, and the newest. It is an area of residence and industry, but these are strictly segregated by zoning ordinances. Residence itself is also segregated according to class; first and third class never abut, a second class area always interposes. However, with the recently increasing social and political mobility, class segregation has become much less rigid than it was a few decades ago, when residential zoning was avowedly on a class-and-race basis.

Cullen, Gordon
IXTH DELHI
The Architectural Review, Volume CXXVII, Number 756, February, 1960
Pages 110-117. Illustrations.
711.01: 711.432 (540)

1. The phenomenal growth of New Delhi, doubling since 1941, has brought to an acute point the problem of organizing its largely uncontrolled and sporadic growth into a significant and viable pattern. EKISTICS has abstracted articles during the last several years which involve part of this problem: In December, 1959, "Shopping Facilities in Southern Delhi--An Analysis" (No. 50) and in March, 1960 "Construction of Experimental 'F' Type Quarters in Delhi" (No. 53).

2. At present the Town Planning Organization is preparing a plan for presentation to the Government of India with the assistance of the Ford Foundation. The resident American planner, Edward G. Echeverria, has been able to call on specialists in the various aspects of modern planning, and the senior consultant is Albert Mayer, a well-known American architect and planner. The Civic Design consultant is Gordon Cullen, whose preliminary report is abstracted here from a precis published by "The Architectural Review." This report is, but one facet of the whole master plan and ideally should be read in all-embracing context of population study, regional forces and pressures, industrial potential, the balance of government and commerce and the machinery of planning which will make this unique plan an all-India prototype.

3. Delhi in the Region and in Time. Delhi is a comparatively new town with little industry, and yet already it is showing every sign of creating a wasteland, or Subtopia, which does not feature in the recognized landscape categories. Unlike many cities of the temperate zones Delhi is not surrounded by countryside, in the pastoral or bucolic sense, as an emotional contrast to the crowded and packed metropolis. The landscape around Delhi is occupied, irrigated and cropped. When not irrigated it is a desert. It is an open-air factory with villages every one or two miles. It is flat. Sometimes you can see four villages in one view. It is a pleasant enough prospect but it does not provide a pastoral contrast (the winding groves and streams, the green bowers and solitary places, the well-loved picnic spots). In Delhi this will have to be created. For Delhi is in this respect somewhat like a ship at sea which, surrounded by salt water, must carry its own fresh water with it.

4. Consequently, Gordon Cullen puts forward the view that the acreage of park and in particular the Ridge should be sensibly increased and that the park should become one of the great landscape categories. He thus develops a picture of a built-up, compact city surrounded and interpenetrated by landscaped parkland, the whole unity fitting into the topography of the great continuity of villages. There would be no wasteland--no compromised land.

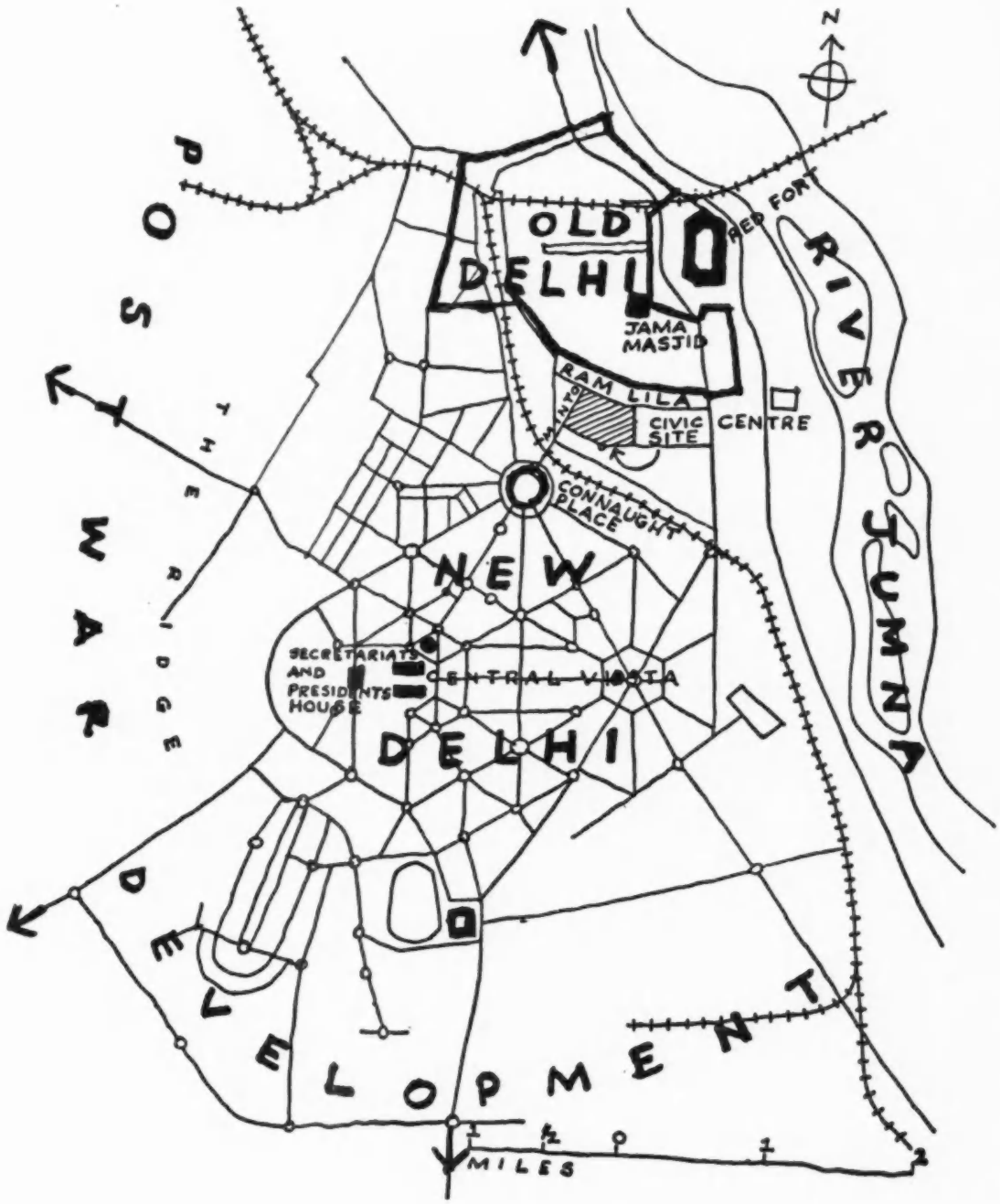
5. The Problem of Residential New Delhi. New Delhi was not designed as a city but as an extremely grand housing estate for the officials of the government of occupation. It was, literally, the last word in Civil Lines. Apart from the full blooded but somewhat boring Beaux Arts street layout the total effect is fine. (Most of the avenues are aimed at some remote architectural feature which keeps popping up again and again, saying 'Cuckoo! I'm here'). The avenues are broad and spacious, the trees arch over the road, and the footways and houses are spaced far apart.

6. Old Delhi: Three hundred years ago Shah Jehan created Old Delhi. It was the Civil Lines of his day and inside the protective wall lay the two great monuments, Jama Masjid and the Red Fort. Also there were the spacious homes of some hundred noble families. As time went by the gardens were built on and traders encroached on to the streets. There they established squatters rights and the process began again. Today Old Delhi is one of the most congested pieces of urbanism in operation.

7. With this lesson from the past what is to be the attitude towards the anachronism of New Delhi? Can the Capital City of India afford to preserve the present aristocratic density or should it accept this density as a desirable norm and develop a huge, sprawling Delhi in which two storeys is the average height? Quite clearly the centre of Delhi must be made available to many more people and the question is really how best to do this, not shall it be done at all.

8. A glance at the map shows how the road layout creates a number of sectors. If, therefore, operations are started by developing the sectors from the center outwards, there is enough space to build intensely urban cores of flats, shops, schools, cinema and other interesting buildings. The next step would be to regard the whole zone as a precinct and develop the roads to the east and west as main through roads. This would reduce the pressure on the green avenues. In this way the usual order of things has been inverted. Instead of built-up traffic routes with shops and houses on the busy streets contrasted with green gardens behind, we have shady green and quiet roads with enclaves of jolly and vital urbanization in the interior. It is, of course, just the ordinary urban precinct system but in this case the circulation system has a powerful personality of its own.

9. Central Vista and Parliament. The length of the vista from Rahstrapati Bhawan to the War Memorial is nearly two miles. Its effective length and width is infinite since few buildings are more than tree height. Now, six story buildings have started to be built at the west end and are moving east. Against this development I put the following arguments. The axis is not enough to pull the twelve separate buildings to life. If all the buildings in the complex, secretariats, parliament, etc., are to be separate we shall never get a city. We shall simply get a forest with buildings in it.


N
OLD
DELHI
RED FORT
JAMA
MASJID
RIVER JUMNA
POST
RAM LILA
CIVIC
SITE
CENTRE
CONNAUGHT
PLACE
NEW
DELHI
SECRETARIATS
AND
PRESIDENTS
HOUSE
CENTRAL VISTA
THE RIDGE
WAR
DEVELOPMENT
MILES

10. In my view there are two distinct landscape forces at work in the Central Vista area.

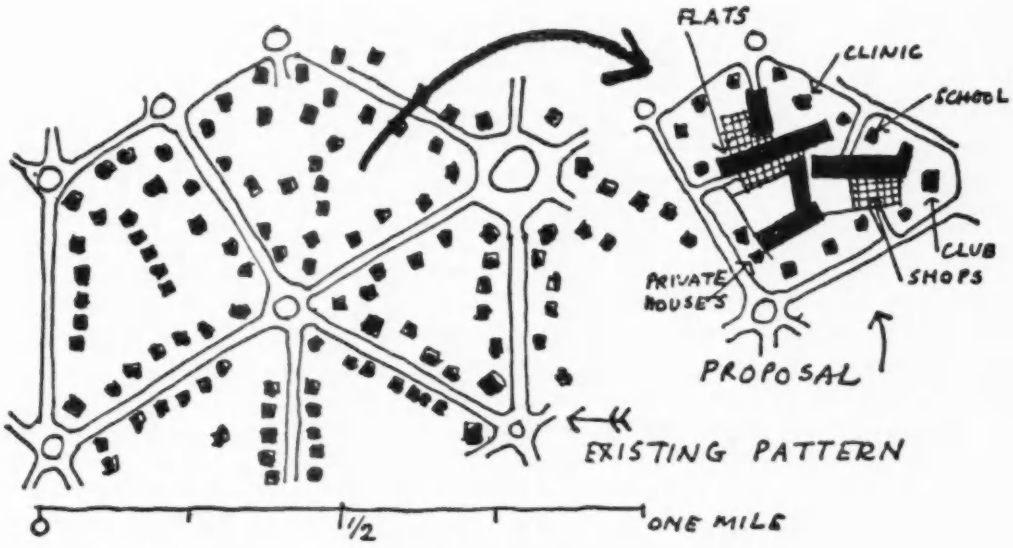
(1) At the western end there is an inward thrust aimed at the two Secretariats and Parliament. Parliament Street bears down from Connaught Place (with its commercial and business potential) and the natural accretion of government floor space will be concentrated in this area.

(2) From approximately the middle of the vista to the east there is an outward thrust which is generated by the parklike landscape of the central vista linking with the Beaux Arts planning of the residential zones to the north and south.

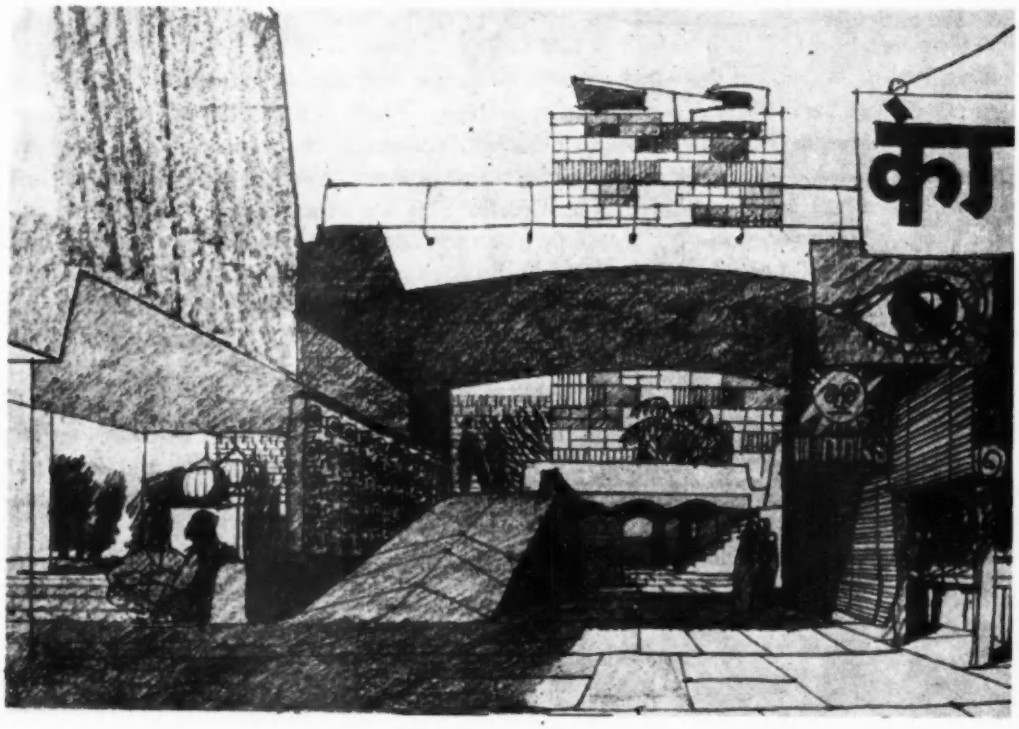
There must be a point along the line of the vista where the inward forces give way to the outward forces and the discovery of this point beco mes a key task. Since the essential view is the vista as a whole we must take as our standpoint the view from the Secretariat. What we wish to create is a division of the axis into two parts: the Here of the government complex concentration and the There of the landscaped areas. A sense of metropolitan locality must be generated by the existing block of government buildings which, at the moment, lies on its axis like a ship at anchor, alone on the water. It must extend its influence so that new developments will be homogeneous.

11. Normally it is difficult to make additions to a building without spoiling the original conception. In the case of the Secretariat group, however, we find that the composition is basically that of pavilions set upon a red sandstone plinth and we can regard the pavilions as inviolable whereas the plinth can be added to without destroying the conception. For instance, if the plinth came forward with two extending arms like two arms of a pier enclosing calm water, then we would have extended the influence of the Secretariat block. By the conception of the plinth we have released a unifying power, a creator of spaces and enclosure and any building erected on the plinth will immediately be in relation to the original pavilions. On this red, geometric base we can place, strategically, the new buildings; the actual manipulation of the plinth will be aimed at weaving the whole Government, Central Vista and Parliament Street complex into a coherent unity.

12. The Civic Centre. The Old City with its 1,000 people per acre, its slums and overcrowding, its noise, bustle and vitality, its bargaining, and industry is separated by a hundred yards from New Delhi; spacious, leafy and quiet. One literally bursts out of the jungle of New Delhi and sees across the open space the sunbaked, uncompromised wall of the Old Town. In this circumstance there exists a dramatic situation. There is an awareness of difference running all down the face of the two towns.



Existing and proposed patterns.



13. The Civic Centre is to become the 'capital of Delhi,' then it will have to dominate. It must do this in scale and sheer height as well as in content. On the other hand it must do this without absorbing either old or new Delhi, without absorbing or lessening the character and uniqueness of either, for this is neither necessary nor desirable. Briefly we can imagine the Civic Centre as a cellular structure not isolated but attached to New Delhi. A lofty, hollow cliff forming the northerly climax of New Delhi and dominating the Old City by its size and proximity. The dramatic situation has been created by the act of juxtaposing the Civic Centre and Old Delhi across the narrow green strip, and all that remains is to exploit it.

14. It is enlightening to compare the Civic Centre with the other two great focal points of the city; I mean the Secretariat and Jama Masjid. Both of these have one thing in common, their use of levels. Both are raised high above the normal road level and this bestows on them a distinction which is not only legitimate but exciting as an element in the structure of the city. What more natural than that the Civic Centre follow suit. Placed upon this raised public space will be all the buildings of the centre arranged to form enclosures and subdivisions of different scales and complexity to suit the various functions.

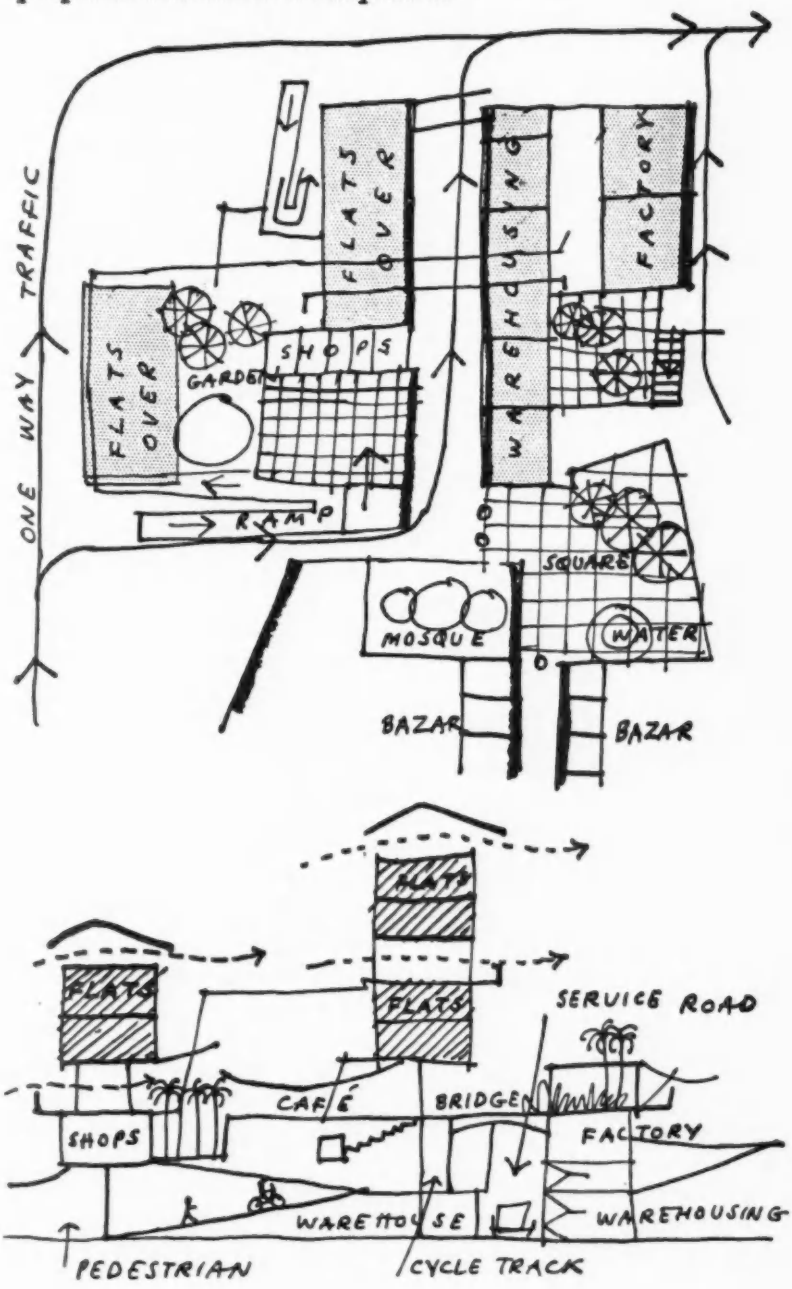
15. Rehabilitation of Old Delhi. The sore points apart from the obvious ones of dereliction, slum property and sewerage concern:

(a) Industry.
(b) Traffic.
(c) Overcrowding.

16. The average building height is two storeys. In view of the position of Old Delhi in the capital of India and the land values this is too low and will crack sooner or later. Traffic conditions inside the old city are appalling. There are about twelve different road users: trams, bicycle rickshaws, tongas, cycles, bullock carts, sacred cows, pedestrians. The roads themselves, with one or two exceptions, cannot take two-way wheeled traffic. People who live inside Old Delhi and own motor cars are at some difficulty to know where to park them. Some form of traffic rationalization is to close the old city to wheeled traffic. Then there is the industry of Old Delhi, which is carried out with precision lathes and all modern tools almost literally on the pavement. On top are the houses. This picture does not include offices and shops, the sudden stillness of the courtyards of mosques, and herds of buffalo.

17. In face of this the obvious thing to do is to increase the height of buildings in the form of flats to relieve congestion, open up wider traffic routes and zone industry into proper rentable factories. By doing this, I feel, one would destroy a great deal of the homogeneity of the old city. By moving people from the ground up into the air in flats we disassociate them from the life of the ground. By widening the streets we turn people off the roads which are the life of the town; the roads become untenable. By grouping industry into factories we begin the disintegration of the unity, we take the men away.

Schematic plan and section of the old city showing proposed multilevel development.

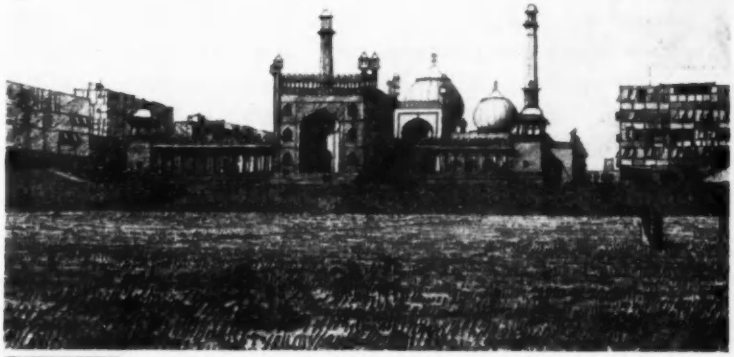


18. I propose that whilst it is inevitable and desirable for the buildings to rise from an average of two storeys to an average of four the public circulation and recreational space be drawn upwards also so that the families in flats are not isolated from the ground. In other words, we plan in three dimensions, not two. We create an artificial hill town in which the different levels are unobtrusively linked by shopping streets which are, in fact, ramps. If, for instance, we create alternative levels of circulation then traffic will sort itself out. If, instead of zoning workshops to one particular place they are arranged at suitable levels then they remain efficient and integrated. Open space and recreation need not necessarily be on the ground. They can be twenty feet up, or higher, thus developing social life at different levels and tying all together.

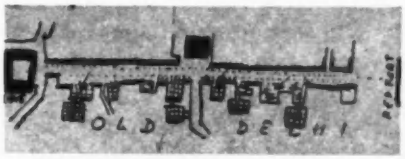
19. Chandni Chowk. Chandni Chowk is the main shopping and commercial street in Old Delhi. Three quarters of a mile long it runs straight east and west between the Fatipur Mosque and the Red Fort. It has a dusty and faded elegance and colossal vitality. It is one of the very few streets in Delhi which has scale and incident.

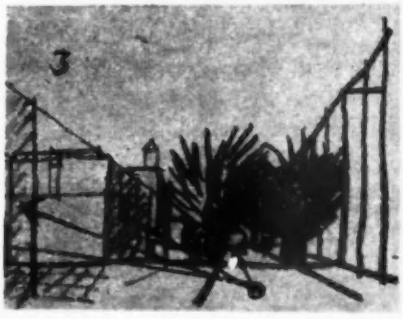
20. Chandni Chowk is a place which seems to precipitate the formation of groups. It should be designed for this behaviour. First, its somewhat ragged avenue of trees should be completed by new planting, both for the welcome shade and for the fact that a tree is a vertical object; you can lean against it or put a seat round it; it becomes an aid to street sociability. Secondly, Chandni Chowk is a straight street, a corridor street, and this does not excite sympathy. What is needed is enclosure of some sort to provide the background for the group. The space needed could be obtained by widening the street but this would not give the required intimacy of enclosure. The solution put forward is to regard the north side of the street as a tall cliff but the south or shaded side as a cliff with caves. We do not widen the street but where there is a derelict property it is removed and turned into an alcove, into a small courtyard open to the street with trees and shade if necessary.

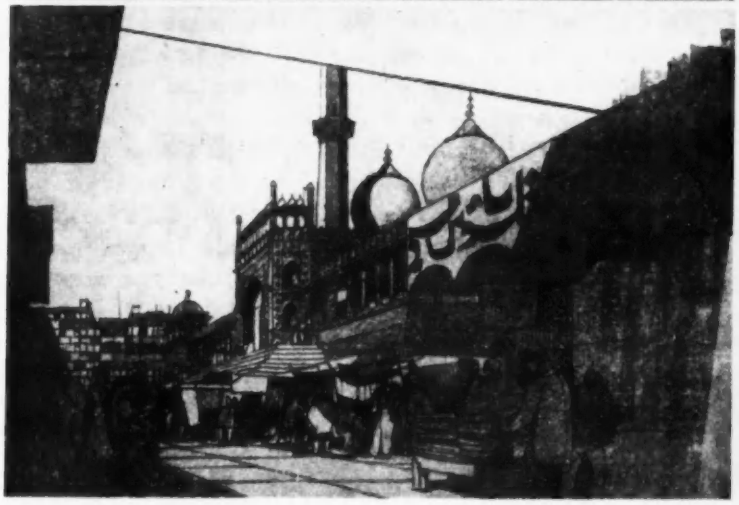
21. The Jama Masjid and Red Fort. Jama Masjid, the great mosque, lies in Old Delhi but faces the Red Fort across a wide stretch of parkland. There are two main problems, first the siting of the mosque in the old town, the sort of enclosure and development necessary, and second the scenic possibilities of the mosque and Red Fort together. Consider the place of Jama Masjid in the internal disposition of Old Delhi. The first outstanding fact is the existence of its magic, elevated plane; this vast, quiet courtyard. Link this to previous proposals concerning the rehabilitation of Old Delhi, the advocacy of a multi-level development to preserve the integrity of the social structure, and the prospect is exciting. Can we but create public spaces at the same level as the courtyard, however tiny or distant, then the intervening space, across the noise and turbulence below, seems like an electrical discharge. Hence, the gambit of raising the entry to the square from the Red Fort area, so that access to the upper level is natural and easy. In this way, gradually we attempt to join and link and bring all the city into a significant relationship.



Top right, the new approach to the Jama Masjid and Red Fort unified by screened vista. Centre right, proposed landscape treatment of the Mosque. Bottom right, penetration to immediate neighbourhood of the Mosque reveals intense activity and trade. Below, plan and proposal for area between Red Fort and Mosque.







22. Neighbourhood Centres. I want to try to put forward the idea of a centre as being a place, a locality, a personality, an object like sculpture encountered on the road. The road landscape with its sweep of turf, its trees and its rocky outcrops is one thing and the habitation is another. The wall varies in height and composition. Here it is windowed and clearly forms part of houses, there it is plain and we palms and fruit trees over it. Gates and openings occur leading to an interior life which to us is still invisible, but its existence is manifested by the towers and domes visible above the wall.

23. Suddenly the wall juts out at right angles and the road penetrates into the hitherto secret structure. We are in the civic centre the seat of local government. of big shops, of factories and entertainment. It is a nodal point in the journey for we can use the centre, stop and wander about, buy things and visit.

24. Now start again, start in a house. We are here in a courtyard it is open to the sky. It is the atrium and contains the door from the street, the fireplace, the shade tree, or the means of shade, it also contains a door leading to water and sanitation. Off this main space are a sufficient number of private rooms. This is the first and greatest of places, it is sky and fire, water and sleep, conversation and worship. The family amience reigns inside the courtyard, but open the street door and we enter a large space created by the walls of ten or twelve houses, it is a street but also a space which is collectively owned by the people who live round it. It is here that the family becomes part of the community because here they meet and chat and help each other. Perhaps several of these spaces will lead into a local centre with temple, shops and bus stop. In this way we build up from place to place, from domestic courtyard to the common ground of neighbours and from this to the places of commerce and business and trade. Yet all is kept integral, all has a sense of place and belonging right up to the civic centre itself.

Drew, Jane
PLANNING IN PERSIAN OIL TOWNS
Town and Country Planning, January, 1960. Pages 38-42. Illustrations.
711.423 (55)

1. Jane Drew is a British architect with a wealth of experience in tropical and undeveloped countries having participated in the development of Chandrigarh and now Persia. She brings interesting insights to the special conditions that govern town planning and the design of living in a hot climate and under severe economic limitations.

2. Persia is a poetic place, a land of purdah, poetry, poverty and of immigrant population, at any rate in the south and our problem was to do town planning and housing for oil companies there. The tribes' architecture in these areas was either of the tent variety, or, where it was more permanent, it was in mud and the rather beautiful forms which mud architecture takes reflecting both an innate dignity and power of imagination. Existing oil company housing, on the other hand, was healthy, secure, and stable, but it lacked poetry; it had a standardization which did not seem to be suitable for the kind of effects of the country and people. The houses did not seem to have grown into towns.

3. Rigours of Climate and Economy. The climate is very hot and dry during the summer with little or no humidity; dust-storms are frequent and heavy, coming mainly from the north, and there are hot winds of occasional high velocity up to 100 miles per hour. Driving rains, sometimes at an angle of 45 degrees, come in very short, heavy downpours which have been known to last a week on and off, and during the real periods when rains come, one week may produce 5 inches of rain, although the annual total for the year is only 7 inches. The problem was to produce housing which would be cool and comfortable for this climate.

4. We had, of course to do this within a strict economy and we had to produce house types that would with minor variations, be usable in towns in various of the oil company "field" areas inside Persia. In some places the only local material that would be economical was rather a pleasant yellow brick, rather soft in quality, and in others there was stone available, but, of course, stone houses are rather hotter than brick. Our chief innovation structurally was the introduction of cavity brick walls and random stone in the stone houses, otherwise we adhered generally to the principle of using local materials for the major part of construction, the only imported materials being for roofs and windows. There is practically no woodwork or wood available in south Persia and the climate is such that by and large we have used metal windows everywhere.

5. House Types and Street Plans. We divided our houses into types from senior staff down to labourer, and in town-planning the cheaper types of houses were

integrated into the street design, so that the street lighting is carried on the houses themselves. The houses had connecting arches at the end of the streets, which served not only to give privacy to houses but also as supports for the services. Special house types were designed at the end of the streets for articulation. Since the majority of the labourers are pedestrian we designed the streets with a view of giving comfort to pedestrians and simply allowing car access where it would be required in the case of emergency, illness, or for refuse collection.

6. Animals and Open-air Living. One of our problems was to discourage animals from entering the compounds. These migrant people were used to keeping animals and to an open-air life. We also had to plan houses which were capable of extension and to make possible open air living and sleeping. The minimum houses' needs could be summed up as follows. They had to be two-roomed, cool in summer, warm in winter, with their own walled compound, and the windows had to be burglar-proof and shaded from glare. Sanitary facilities had to be provided somewhere where they would be available to the family whether they were sleeping indoors or in the compound, and the kitchen had to be near enough to the rooms for convenience but far enough away not to be a source of heat.

7. The Bazaar. The real centre to these little towns is always the bazaar. We planned bazaar areas in with the mosque and such local industry as there was so as to form a centre where the normal outdoor activities were, as far as possible shaded, and could take place with some feeling of town centre. Cour propositions included one or two things which would be very unusual for European towns today: places where animals could be securely kept and places where sporadic private development could take place happily without disturbing the general layout of the towns, because wherever there is lighting and water in south Persia, towns automatically begin to sprout.

8. Houses and Neighbourhoods. The sites on which these houses are were often virtually bare and one of the criticisms of the early housing was that it was not possible to reach the compound without bringing muddy feet across the carpeted room. We found that Persian carpets were owned even by the migrant people and were everywhere very treasured possessions.

9. Where possible we produced two-storey solutions in order to give some variety in the towns, but the bulk of the people were so poor that one-storey housing had to be the general solution and we have tried to break up the monotony by high walls. However, the small scale of the roads and the grouping of pedestrian precincts away from traffic roads and centres gave housing groups and sense of locality. Since our housing had to fit in new or existing towns we evolved a planning policy rather than a plan. Oilfield towns are quite unpredictable as to their size and rate of growth. We therefore established principles rather than formed plans.

Percival, R. N.
ELLIOT LAKE: ANOTHER VIEW
Town and Country Planning, February, 1960, Pages 61-65. Illustrations.
711.4 (71)

1. Elliot Lake is a new town created to serve a new industry in a formerly unurbanized area, while another Canadian new town, Don Mills, is actually a new suburb with industry and part of the metropolitan Toronto area. Elliot Lake provides an interesting comparison to Imatra, the new town in Finland in April's EKISTICS and this description of it is presented from a different point of view by Mr. Percival than that presented by Norman Pearson in EKISTICS (No. 40) February 1959. Some of the problems pointed out by Mr. Pearson have been solved with time. Other of Mr. Pearson's criticisms are put in the framework of legal and time limitations, or in R. N. Percival's words: This article, in the nature of a reply to Mr. Pearson, explains some of the reasons why certain things were done--things due to legal limitations, things for the sake of expediency, things because of a shortage of time --all sorts of things which preclude the quotation of this development in academic circles as an example of good town design. It is however, a place to live, a place where the surrounding landscape is unspoilt by sporadic and ribbon development, where the homes, schools and churches are bright and clean, and where traffic circulates freely and safely.

2. Speed of Growth. A community has been created here in three short years from absolute scratch. When the first bulldozer commenced pushing over the first trees for the initial housing development the designers had just received the air photos and were just making their first field investigation.

3. The district is rough, extremely rough, being composed of bedrock protrusions over most of the area, interspaced with lakes, and covered by dense forest where the top-soil depth has allowed trees to gain a foothold. Mining officials picked out one spot in a 400-square-mile area where a community of reasonable size could develop. This site, inspected by Provincial officials, was agreed upon a few weeks prior to the mining companies commencing housing operations.

4. Planning Technique. The planning staff advised that, owing to the extremely difficult ground conditions and limited area available, dwelling units in multiple form would be essential in the housing programme. Such development would be most economical, suitable for this northern clime, readily acceptable to the future residents, and pleasing aesthetically. After about one month of intermittent discussion, this concept of residential development was, to a large extent, abandoned for the following reasons:

a. Provincial law required direct vehicular access to each property.

b. Provincial law required registration of a lot, block, and road plan prior to selling any site.

c. Neither the municipality, the Province, nor the Federal authorities were housing authorities. All houses were to be built by the mines or private enterprise and neither of these were even remotely interested in becoming landlords.

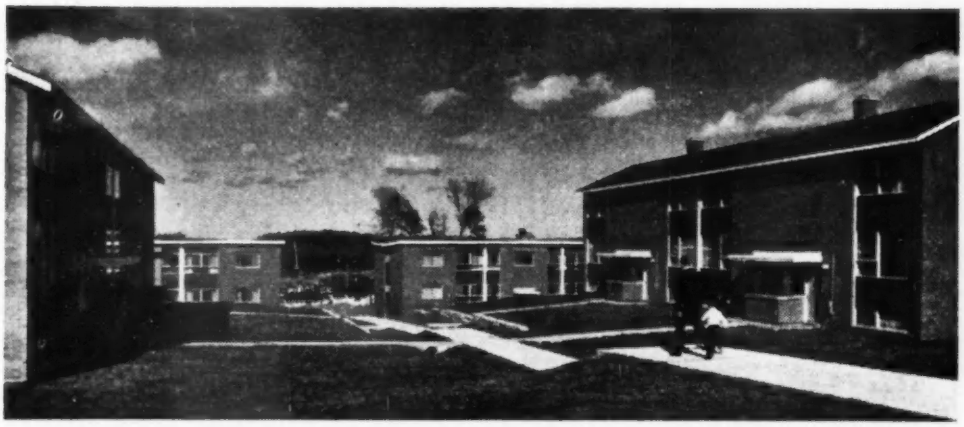
d. There was, and still is, a prejudice against the row house in Canada.

e. There wasn't time to experiment, and no takers anyway, due, in some part, to the short-term nature of the uranium contracts.

5. Land Tenure and Planning. The design of the Elliot Lake town centre was a challenge to the civic designer, the engineer, and the real estate man in more ways than one. Provincial policy dictated that land would be sold by auction and the planners were thus faced with devising a system whereby lots and blocks could be sold in a manner which would result in a harmonious design when the buildings were erected. A modular system was devised for the registered plan and detailed "offers to purchase" agreements were drawn up for each type of lot, that is to say, corner lot, or lot in the centre of a block, and in accordance with the size and shape of lot. It was, in execution, a combination of private enterprise and government control and the result is mediocrity--from a design point of view; circulation is good, architectural harmony almost non-existent.

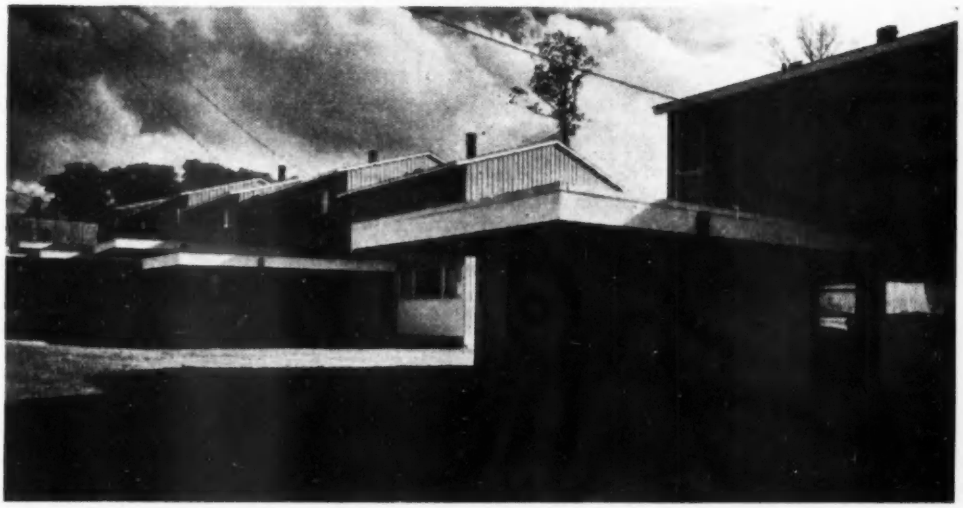
6. Residential and Commercial Areas. Elliot Lake was not planned as a twin city--developed in two distinct halves--for any reason other than the land form and bedrock made it so. At one stage the population was expected to rise to about 30,000 people and nowhere was there sufficient land within a 400-square-mile area to create a community of this size in one piece. The two communities will consist of three to four neighbourhoods each, and the first section, now complete, will house about 14,000 people. In one respect it may be fortunate that the demand for uranium has not reached expectations and the town will stabilize at about 15,000 people; in other words, only one-half may now be built.

7. About 12 per cent of the land area within the neighbourhoods so far developed, was set aside for multiple dwellings and this has been largely taken up. This is a very different figure from the 12 per cent of dwelling units referred to in Mr. Pearson's article. It results in between 35 and 40 per cent of the accommodation being provided by multiple units.



Terrace houses and flats in the second neighbourhood.

Terrace houses in the first neighbourhood.



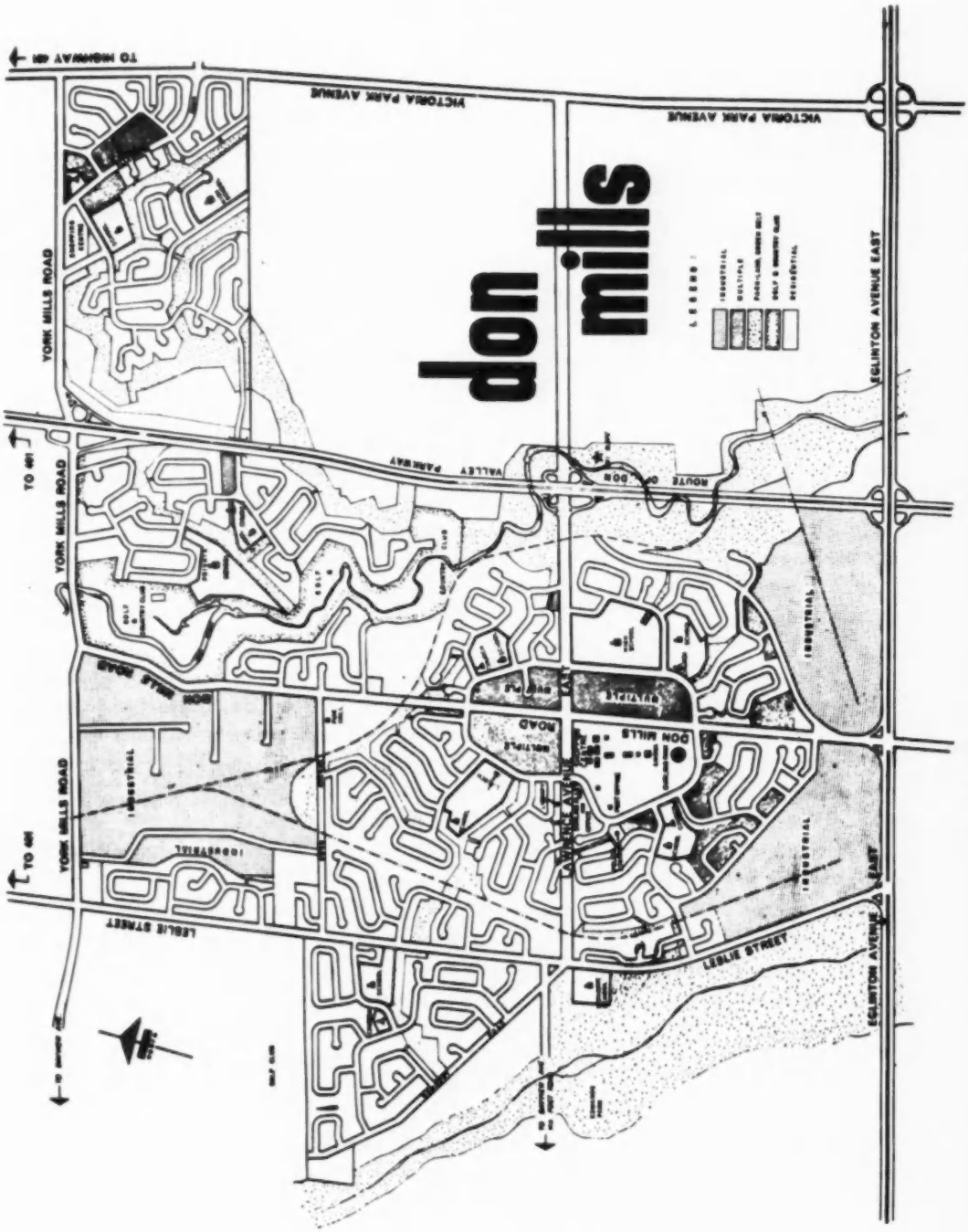
Oldham, Jack
DON MILLS "TODAY'S NEW TOWN"
Urban Land, Volume Nineteen, Number One, January, 1960. Pages 3-9.
Illustrations.
711.4 (71)

1. Don Mills was used as one of the examples discussed at the Urban Design Conference at Harvard University in April, 1959. The abstract from this conference was printed in EKISTICS, August, 1959 (No. 46). This included an aerial photograph (page 127) and discussion particularly in comparison to Vallingby, Sweden. This month, an abstract of the story of the development of Don Mills is used as told by its Public Relations Council.

2. The Canadian community of Don Mills, near Toronto, conceived and planned on the "new town" principle, can be regarded as the first planned new town in Canada although it is not in itself a municipality. It contains a central core consisting of a shopping and commercial centre, major recreational attractions, office buildings, post office, police station, library and so on. Around this area are located the residential neighborhoods, with the industrial development concentrated in the northwest and south. Development began in 1953. Today, it is almost completed, and while the developers will be among the first to admit that mistakes have been made, the community stands as a monument to free enterprise and is one of the major achievements in the annals of Canadian real estate.

3. Location and Site. The acquisition of the 2,058 acres that now make up the site of Don Mills began in 1947. It was inevitable that this land, situated in the northeast section of Metropolitan Toronto, about eight miles from the heart of the city, would sooner or later come under some form of urban development. When Don Mills was planned, the land was still inaccessible from the Don River Valley, and was the only large undeveloped area situated so close to the heart of the city. However, a major highway between Detroit and Montreal was planned, which now passes along the valley one half-mile north of Don Mills. Both the Canadian National and Canadian Pacific railroads pass through the site.

4. Advance Planning. The objective was to build an integrated community of residential, commercial and industrial development with an assessment ratio of 60 per cent residential and 40 per cent industrial-commercial. The industrial development was to be confined essentially to the south and northwest parts of the community. The main commercial development, along with major civic and recreational projects, were to be located in the community centre, while the residential development was to be undertaken in planned neighborhoods around and beyond the central core. Furthermore, the residential developments were to include single-family homes, semi-detached homes, row housing, terrace housing, both walk-up and high-rise apartments, duplexes and


don mills
VICTORIA PARK AVENUE
YORK MILLS ROAD
VALLEY PARK WAY
EGLINTON AVENUE EAST
LESLIE STREET
DON MILLS ROAD
INDUSTRIAL

quadraplexes. Single-family homes were to be designed to sell from $12,000 to as much as $50,000 and on lots ranging from 50 to 100 feet in frontage. Similarly, a wide choice of apartment accommodation with a corresponding range in rents was included in the objective.

5. Architectural Design. With regard to architectural freedom, it should be emphasized that, while the development company maintained co-ordinative control over all building in Don Mills, and retained the right to reject a house design--and frequently did--nevertheless, the builders and their architects had a free hand in the matter of basic design. In all, well over 200 distinct house designs have been used by these merchant builders. Add the homes that individuals have designed for themselves, plus the grouping, siting, color harmony, array of buildings and architects, methods of lot allocation, and so on, and any "project appearance" was virtually assured to be eliminated.

6. Industrial Development. Industrialists were cautious in the beginning, and had reservations about the restrictions relating to set backs, sideyards, coverage, the kinds of materials that could be used in construction, outside storage, undue noise or odor, types of outdoor signs, parking control--restrictions which, in fact, governed just about anything that might be considered offensive or out of harmony with the overall concept of the community. No concessions were made in regard to modifying these restrictions; the only concession made was to price the industrial land, initially, below the going market in Toronto. Soon all the industrial land was sold.

7. "Mistakes We Have Made." Mistakes have been made both in planning and development. For example, the overall plan called for substantially large elementary school sites which would be used for both school and after-school functions. As it turned out, the school grounds are little used after school, and independent play grounds would have been better. Paradoxically, it was thought that 10 acres would be sufficient for the high school. But it proved to be just half of the acreage necessary to embrace all modern-day high school activities. Somewhat better utilization of land could have been achieved in parts of the community had some of the municipal zoning by-laws had been altered in time. The by-law limiting the height of buildings to 35 feet or less is a perfect example. Eventually this was changed to permit the construction of taller buildings, but there is still too much of a "horizontal look" to Don Mills..

8. Don Mills Today. The success of Don Mills, with some 70 industries and 56 stores in the main shopping center, as well as being a pleasant place to live, has encouraged the developer to try his hand again. To this end the company has acquired land west of Metropolitan Toronto for the development of a community several times the size of Don Mills. It is expected that this development will get underway within the next two years.

Koenigsberger, O., Millar, J. S., and Costopolous, J.
WINDOW AND VENTILATOR OPENINGS IN WARM AND HUMID CLIMATES
Printed Pamphlet. 15 pages. Reprinted from "Architectural Science Review," 1959, Vol. 2, No. 2., July, pp. 82-96. Illustrations.
69.028.27: 69.028.31 (213)

1. Dr. Otto Koenigsberger, Director, Department of Tropical Architecture, London, J. S. Millar and J. Costopolous, both of Institute of Technology Northwestern University, Evanston, Illinois, U.S.A., have combined efforts to produce an excellent analysis of the kind of openings needed in tropical climates to exclude rain and insects but allow wind. Both the method of their analysis and their conclusions should be of interest and help to the readers of EKISTICS.

2. Equatorial climates are characterized by warm air and high humidity throughout the year. Other climatic regions have moist-warm periods of varying length. Short of air conditioning, the only relief from the depressing and enervating effect of such weather conditions is brought by air movement. Light winds of velocities from 50 to 500 feet per minute make warm-humid weather bearable and sometimes even pleasant. Theoretically, the ideal house for a warm-humid climate should have a single row of rooms situated at right angles to the prevailing wind. These rooms should have neither front nor rear walls so that light breezes could flow unhindered past the occupants in any part of the rooms. In practice, this is impossible because of the need for privacy and protection against burglars, wild animals, dust, rain, and insects. Privacy and safety from burglars and animals are compatible with the ideal of rooms entirely open to air movement, particularly above ground-floor level. Protection against rain and insects is more difficult to combine with air movement.

3. EXCLUSION OF RAIN. Wind and rain attack a building from the same side. It is difficult to exclude one while admitting the other. Yet, that is just what is needed to ensure comfort. Warm-humid regions usually have high precipitation. If shutters are closed to keep out the rain, the warm and moisture-laden air inside becomes unbearable. A method must be found to let the breeze in and keep the rain out. Complicated mechanical contrivances are useless for low cost housing. Devices which must be operated by hand at the beginning of a shower are poor solutions for rich and poor alike. Rainstorms frequently occur at night or when the house is unattended. Nobody likes to get out of bed to operate mechanical shutters. The need is for a simple device, preferably without moving parts, which keeps the rain out and lets the air in.

4. The conventional solutions of this problem are "Venetian Blinds," "Louvres" or "Jalousies," i.e., a series of horizontal slats (or wood, metal or cement asbestos) tilted at an angle of 45' or more and spaced so that there is slight overlapping between

the top of one slat and the bottom of the next. This solution is unsatisfactory. Rain and spray are driven through the slats by the wind, and the stream of air is directed upwards so that it cannot bring relief to the inmates of the room. The study of the path of raindrops and the experiences of air conditioning engineers indicate other solutions. It was decided to test conventional louvres and other devices under controlled laboratory conditions.

5. Tropical Rains. In order to re-construct a "typical" tropical rainstorm it was necessary to find out what type of rain and wind normally occur together in the tropics. Extraordinary or marginal cases of hurricanes outside the known hurrican regions and cloud bursts of phenomenal intensity and great rarity were deliberately disregarded. To describe a rainshower it is necessary to know its area, intensity, and dropsize spectrum. For the purpose of our study the area covered was irrelevant. Apart from dropsize distribution and velocity, it was essential to know intensities over short periods. A rainfall of 1.0 inch per hour may include a few minutes of very much greater intensity which could cause considerable damage if driven through a window. Published meteorological data, unfortunately, do not always include continuous records of precipitation. We had to base our study on those localities in the warm-humid tropics which have published data of rainfall intensities for periods of five minutes or less.

6. An analysis of typical tropical rainstorms formed the basis for the construction of a machine which would produce, over a test area, showers of intensities ranging from approximately 1.0 to 4.0 inches per hour with correct terminal velocities of the raindrops and a drop-size spectrum similar to that measured by Blanchard in Hawaii. This had to be combined with a wind tunnel capable of providing velocities from 1 to 25 miles per hour. The machine constructed for this purpose was called "rainstorm simulator."

7. The Test Windows. The four window specimens used are denoted by the symbols J_1, V_1, S_1, and M_1. The two commercial windows are J_1 and V_1. The dimensions of V_1 are shown in Figure 14 (page 419). This is the "Constant Flow Ventilator" No. CF/99 manufactured and donated by Colt Ventilation Ltd., Surbiton, Surrey, England. J_1 is a Jalousie type window with the usual glass fittings replaced by plywood. Dimensions and details of J_1 are shown in Figure 15 (page 419). The hardware was manufactured and donated by Arnold Products, Inc., Miami, Florida, U.S.A. The specimens M_1 and S_1 were made at Northwestern University for the project and details of their construction are shown in Figures 16 and 17, respectively (page 419).

8. The four types were studied with reference to the objective of our investigation, i.e., to find a window which keeps the rain out and lets the breeze in. Each window was tried with reference to its effect on the speed and direction of the air coming through it and for its capacity of excluding rain and spray. The air speed was

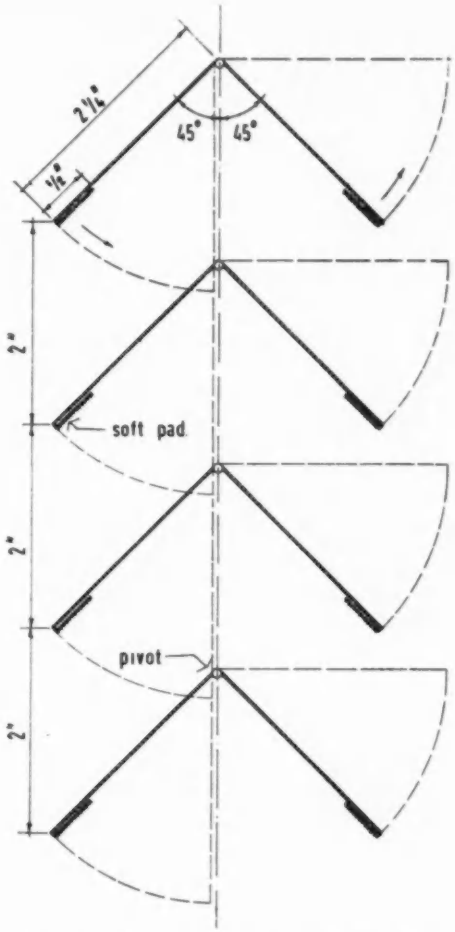


Fig. 14. *Cross section louvre type* V_1.

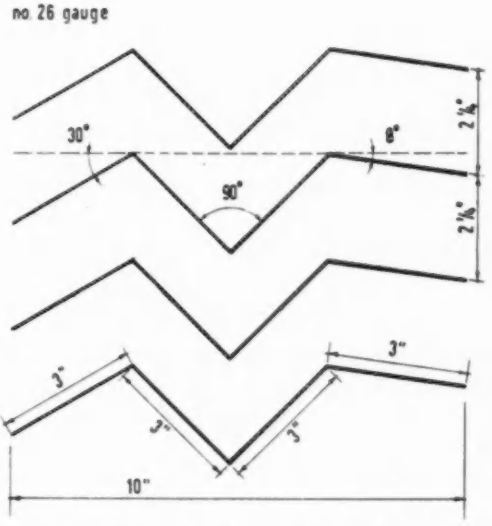


Fig. 16 (above). *Cross section louvre type* M_1.

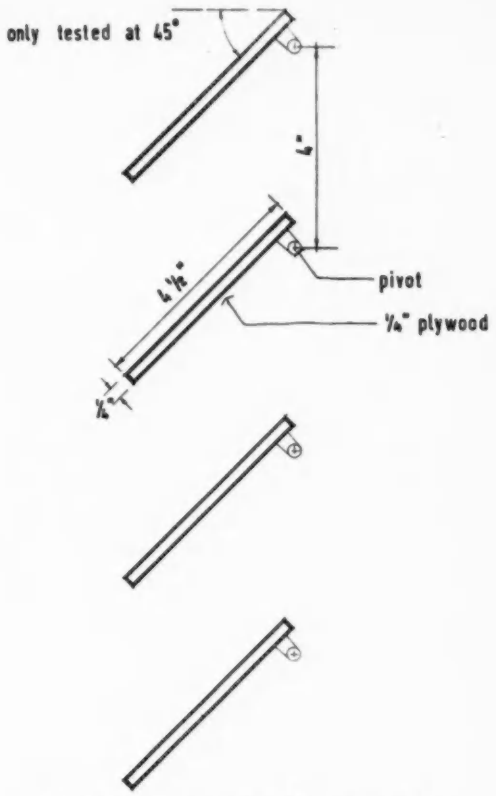
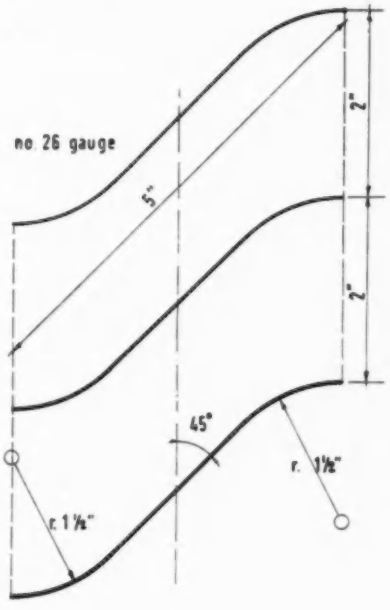


Fig. 15. *Cross section louvre type* J_1.

Fig. 17 (below). *Cross section louvre type* S_1.



investigated by taking readings at several points 4 inches behind the test window, using the same type of anemometer as for the original testing and calibrating of air speeds in the rainstorm simulator. All four samples had the effect of slowing down the breeze, the M_1 -type more than the S_1 and J_1 types. The V_1-type lived up to its name reducing winds of 500 to 2,200 feet per minute to a gentle flow varying from must under 300 to just over 400 feet per minute. (See Table 4, page 421).

9. The penetration of rain and moisture was measured by suspending one inch wide strips of filter paper 2 inches behind the test windows. These strips were dusted with fine methylene blue crystal powder. Even the smallest drop of water dissolves some of these crystals and leaves a distinct blue mark. Drops per square inch per 30 seconds were counted as indicative of the comparative performance of the 4 types. Type S_1 and J_1 failed completely under this test. For all velocities, except those below 100 feet per minute the drop count for S_1 was well above one hundred per square inch. Type V_1 proved satisfactory at wind speeds above 700 feet per minute, but poorly at velocities below 250 feet per minute which were not sufficient to close the movable shutters. The only complete success with regard to rain and spray was M_1 which remained completely dry on the inside for wind velocities up to 800 feet per minute and even at higher wind speeds and intensive rain allowed the penetration of only a negligible number of small drops, hardly noticeable without the sensitive methylene blue indicator. (See Table 4.)

10. It is clear from our tests that only the Type M_1 satisfies our requirement of keeping rain out and letting breeze in without deflecting it. No doubt, it does not represent the only solution. If time had permitted it, we would have liked to try several variations of the basic pattern of Type M_1, including vertical louvres of similar section. As it is, Type M_1 is the only one we can recommend to architects for adoption and to manufacturers for mass production in steel, aluminum, wood, glass fibre reinforced plastic or cement asbestos. Type M_1 ventilators may be manufactured also of burnt clay or ceramic units. If made of glazed and coloured terracotta they may become attractive features of buildings in the warm-humid tropics. Type M_1 is simple and sturdy and therefore suited for use in low cost housing. As the M type forms a series of gutters, we decided to find out whether these gutters would be filled to overflowing in a heavy rain. Six hours of rain of the (impossible) intensity of 10.44 inches per hour and a 25 mile per hour gale were not enough to half fill the gutters. In malaria and yellow fever regions it will, however, be necessary to provide drainage holes to prevent the accumulation of stagnant water, however small the quantity.

11. EXCLUSION OF INSECTS. The usual method of excluding insects is the provision of wire gauze screens for all door and window openings. The rainstorm simulator was used to test the assumption that mosquito screens over window openings reduce the breeze. The test opening was covered by a screen of copper netting made of wire of 0.01 inch diameter with 256 openings per square inch. Air speed was

TABLE 4.

Performance of Test Windows

Wind Speed (feet per minute)	Inside Wind Speed (feet per minute)				Rain Intensity inches per hour	Number of Drops per Square Inch Through Window				
	M_1	V_1	S_1	J_1		M_1	V_1	S_1	J_1 $\theta=45°$	J_2 $\theta=60°$
2200	1450	410	1430	1650	10.44	7	0	100+	100+	100+
					3.78	3	0	"	"	"
					1.08	2	0	"	"	"
1500	820	360	1000	1150	10.44	5	0	100+	100+	100+
					3.78	2	0	"	"	"
					1.08	1	0	"	"	"
800	410	310	580	610	10.44	3	5	100+	100+	100+
					3.78	1	0	"	"	"
					1.08	Zero	0	"	"	"
700	380	270	510	590	10.44	1	14	100+	100+	100+
					3.78	Zero	6	"	"	"
					1.08	"	1	"	"	"
650	240	380	450	510	10.44	Zero	21	100+	100+	100+
					3.78	"	9	"	"	"
					1.08	"	6	"	"	"
500	240	275	370	400	10.44	Zero	37	100+	100+	100+
					3.78	"	21	"	"	"
					1.08	"	11	"	"	"
250	140	110	190	210	10.44	Zero	60	100+	100+	100+
					3.78	"	47	"	"	"
					1.08	"	27	"	"	"
150	100	40	125	135	10.44	Zero	51	90	100+	100+
					3.78	"	33	71	"	97
					1.08	"	21	52	"	76
80	60	30	70	70	10.44	Zero	41	80	100+	100+
					3.78	"	17	64	"	79
					1.08	"	9	41	"	58

Note: The tests with rainfall intensities over 10 inches are merely of theoretical interest. Such rains hardly occur in nature.

TABLE 5

Loss of wind velocity

Screen at right angle to prevailing wind

Outside Wind Velocity (feet per minute)	Velocity Behind the Screen (feet per minute)	Loss of Windspeed in per cent. of Outside Velocity
150	98	35
250	173	29
500	267	30
650	353	47
750	520	46

Average Loss of Speed — 37.4 per cent.

Loss of wind velocity

Screen at 67½° to prevailing wind

150	80	47
250	150	40
500	200	60
650	262	60
750	438	43

Average Loss of Speed — 50 per cent.

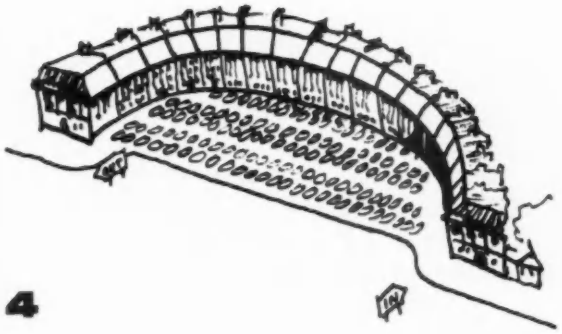
Murray, James A.
HOUSING AND PARKS FOR WHEELS AND FEET
The Canadian Architect, February, 1960. Pages 58-63. Illustrations.
711.7 (100)

1. The February issue of "The Canadian Architect" focused its attention on "AUTOMOBILIA" and its problems, which was a theme of the January issue of EKISTICS. James A. Murray, the editor of "The Canadian Architect" instances the particularly destructive effects which the automobile can have in residential areas. The approaches to solutions which he points out pertain directly to the various articles on new towns and the arrangement of housing groups appearing in this and other recent issues of EKISTICS.

2. The disastrous effect of the parked care on site planning can readily be appreciated as we contemplate what would happen if the parking provisions, quite reasonably required in most North American cities were applied to some cherished European architectural masterpieces. Converted to sublets, as is the custom in our day, the Royal Crescent at Bath (4) could contain about one hundred and fifty suites. "For every dwelling unit, one accessible parking space shall be provided and, in addition, for every four dwelling units, one visitor's parking space shall be provided in an area designated for visitor's parking," says the residential zoning by-law. Bath's crescent would require parking for 188 cars on the site--an area some 56 400 square feet. This 125 percent parking would completely fill the lawn encompassed by John Wood the Younger's fine ellipse.

3. Another influence of the parked car, en masse, is that it may render ludicrous the architect's most cherished illusions of the functional and visual relationship of his building to the site. Judging by results, the site planner is frequently blinded to this undeniable fact--where the car is, there is the entrance. In short, the entrance is closer to the axle than to the axis. (5) It would seem that the more pompous the building's pretensions to high style the more inadequate its recognition of the parking facts of life. This fault is most persistent in Ottawa's recent rash of public buildings. In this, our government is not alone; surely one of the silliest sights of the continent is Washington's stately federal buildings in a sea of two-tones --porticoes among the Pontiacs.

4. Further examples of this curious, make-believe siting and design are to be seen (6) along the superhighways where industry displays its architectural charms. This unsiteliness crops up in the most unexpected places. The last place where one might anticipate neglect of the simple relationship between access, parking and entrance is the head office of the crown corporation concerned with community planning. But there it sits, with its axial "main" entrance doors, terraces and stairs completely



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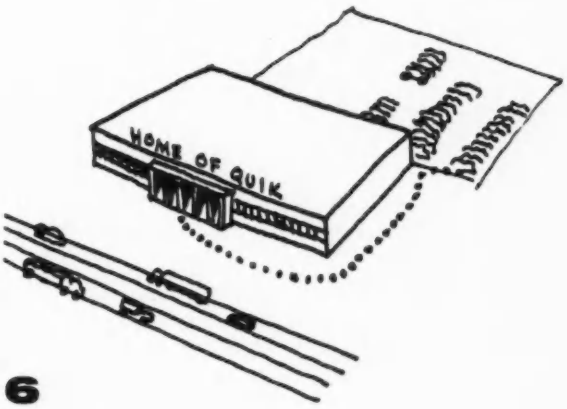

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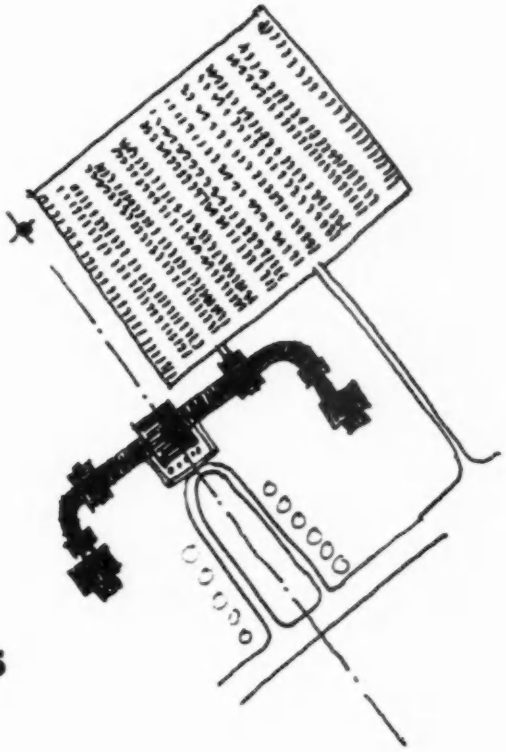

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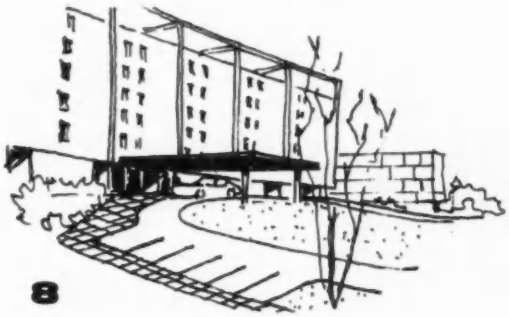

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divorced from visitors and employees alike who enter by a minor side door next to the entry drive. And so it often is with apartment buildings. Much attention is lavished on a spectacular "prestige" lobby, but the tenant finds himself entering the building three hundred days of the year by a rear door and an unattractive service corridor.

5. Two evident principles guide any solution of the car on the site:

   a. The areas of pedestrian use--gardens, walkways recreation spaces--must be clearly separated from the vehicles (7): this is a measure for safety and appearance; and

   b. It is necessary to provide for car circulation very close to all buildings for access in bad weather and for service and delivery (8): emergency vehicles--fire trucks, ambulances, etc.--must have almost immediate access to dwelling units.

6. One of the most successful residential site-planning devices that establishes a pedestrian area and yet brings the car into proper contact with the buildings, is the superblock (9)--a central area of green garden private to inhabitants, with cars confined to shallow perimeter penetration. This may frequently and reasonably involve placing buildings in other than in-line relationship to the street, and certainly involves anything but placing the parking in the rear. Yet both ideas are at complete variance with 90 percent of existing zoning by-laws, which state specifically that "every building shall be located upon a lot fronting or abutting a street and no dwelling shall be erected in the rear of any other building," and "parking shall be provided in the rear yard only." It would be hard to exaggerate the detrimental effect of this type of control on the design of a good residential environment. The end result (10) is that the moving vehicle is using one side of the building (the street), the parked car another (the rear yard), and access road the third and sometimes even the fourth. There is no release from automobiles in any direction.

7. Another alternative (11) lies in combining the moving and stationary car within the geometry and design of the streets serving a housing group. This would involve a re-definition of municipal responsibility and indeed of the basis of taxation. The basic cross dimension of the streets would also need redesigning. If this is done, a slight depressing of parking areas (12), coupled with relatively low hedges or planing, will screen the cars from view even on a flat site. Slight grade changes may be adjusted to produce the same result.

8. Thirdly, parking can be arranged adequately set back and landscaped, on the street side of buildings (13). All three alternatives do away with the building planning problem of providing a "front" entrance to the street and a "rear" entrance to the parking areas, with the attendant problems of circulation to elevators, mail boxes and so on, and of control of the building.

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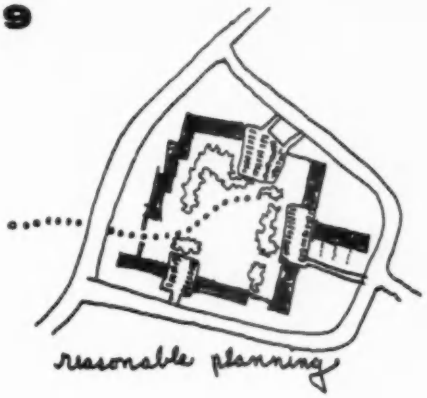
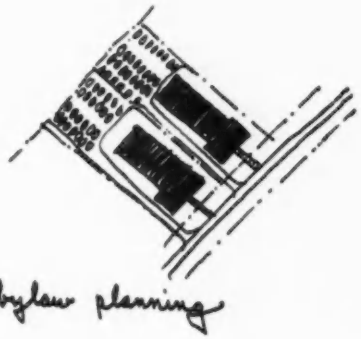


reasonable planning

10



bylaw planning

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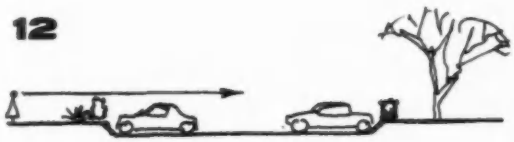

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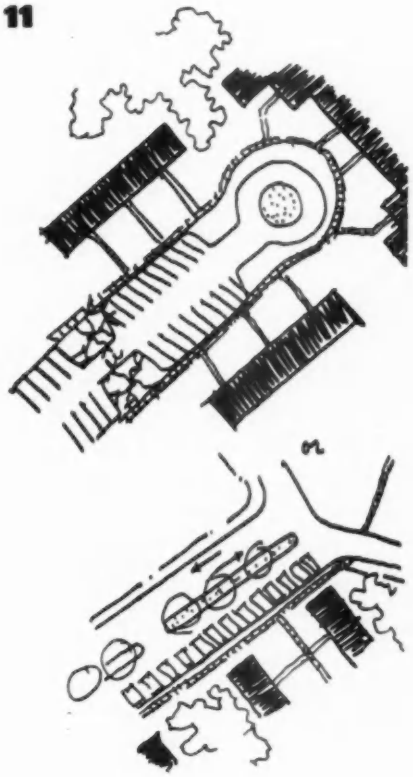

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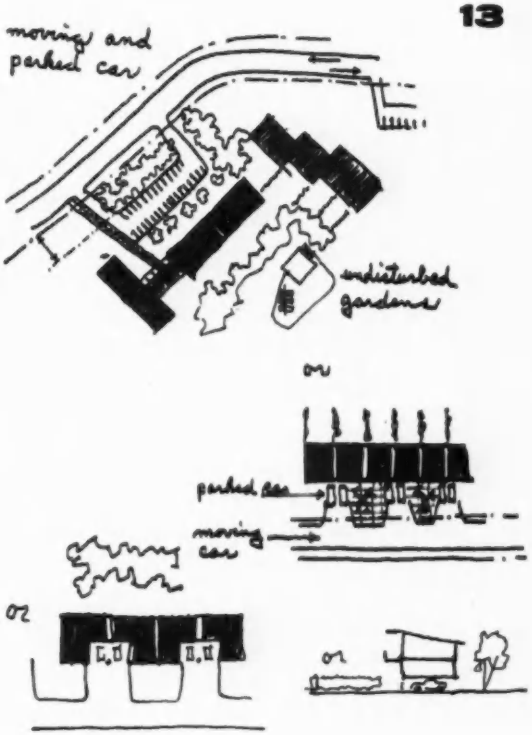


9. The organization of parking for high-rise and for single or one-and-a-half storey dwellings is really two separate problems. For the high-rise building, the sheer mass of cars to be brought together more or less in one place offers a special difficulty. A building of 100 suites under a usual regulation will require some 37,500 square feet of parking places and access drives--five times the area covered by the building. There are five basic ways of handling the parking:

a. Open on the site: this has the advantage of cheapness, but the grave disadvantage that there is no concealment of the sea of cars. It is worth noting that the cars are less in view from a majority of the suites if gathered tightly round the base of the building.

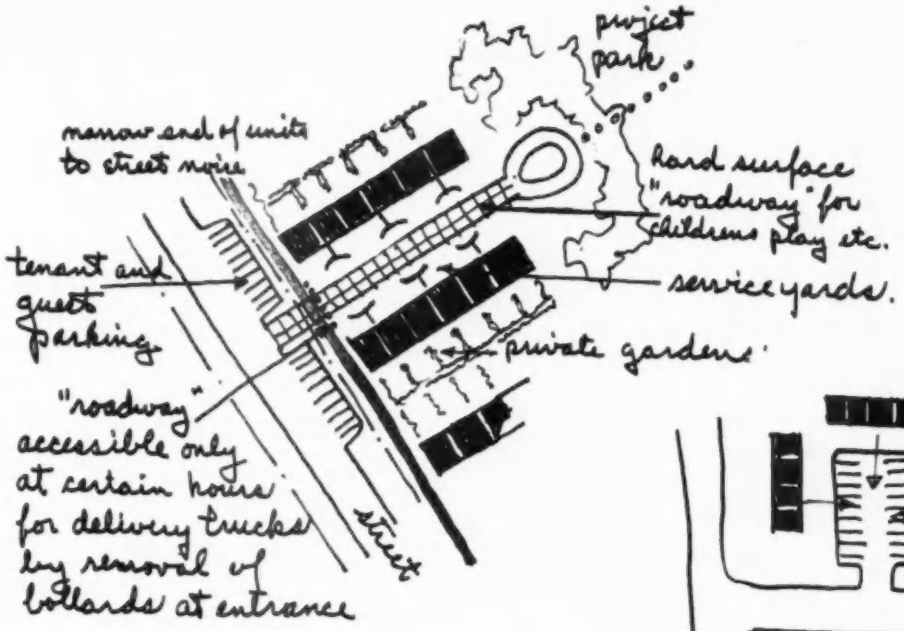
b. Covered shelters beyond the main building: in this case the shelters may be unsightly, but the system offers protection and some concealment.

c. In ramped, open-decked structures: the advantages here are that parking begins to be condensed in land coverage, and that ventilation is still easy. Cost and possible need for supervision are disadvantages.

d. Underground parking beyond the building: the need for ventilation is added to the disadvantages of the previous method (cost and supervision); the advantage, that the maximum green area is freed from parked cars, is obvious.

e. In special multi-level structures, usually ramped: this has the advantage of concentrating capacity, but the disadvantages of cost and of a structure unharmonious to the residential environment.

10. For lower buildings especially, parking can only be considered as one of a number of closely related factors in the site plan, and so it is difficult to speak of parking methods without referring to the pattern of pedestrian and vehicular circulation. (20) The complete separation of the pedestrian and the automobile developed many years ago in Radburn, New Jersey, by Clarence Stein (21) has some disadvantages. The cost of walkways, including land, landscaping and lighting is significant. There is some loss of privacy to individual properties, as both front and rear yards are overseen by the passerby. There is often confusion between the front (park walkway) door and the rear (cul-de-sac street) door. The dignity of the street as an organizing device for houses is lost in a rather nondescript environment of parking, clothes lines and service yards, while the park walkways are not as much used, particularly by guests, for access to the dwellings as was anticipated. It was, nonetheless, a notable innovation, with many valuable lessons for us today.


project park
narrow end of units to street noise
hard surface "roadway" for children's play etc.
tenant and guest parking
service yards.
private gardens.
"roadway" accessible only at certain hours for delivery trucks by removal of bollards at entrance
street

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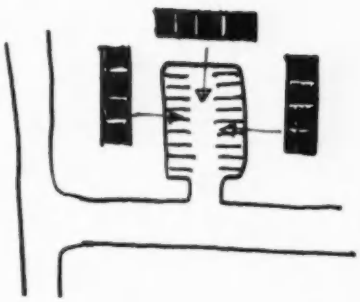

poor

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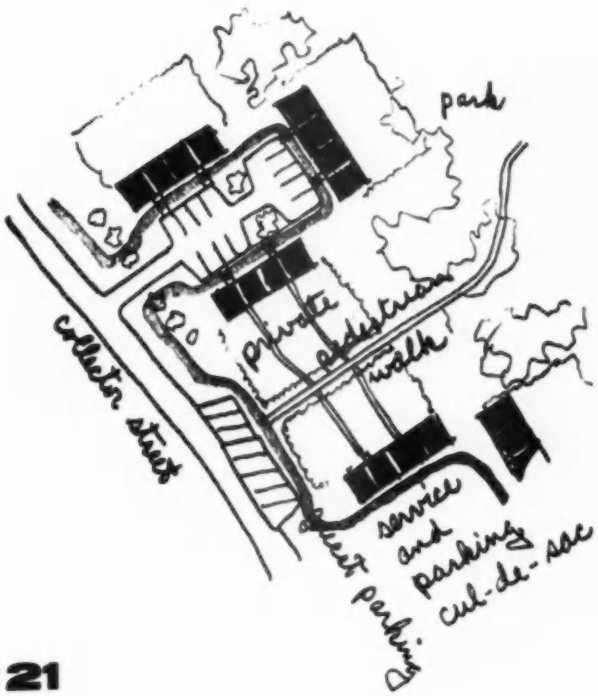

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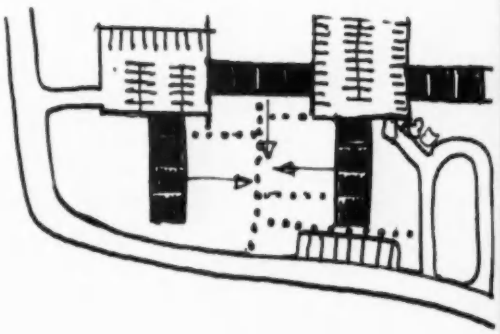
better



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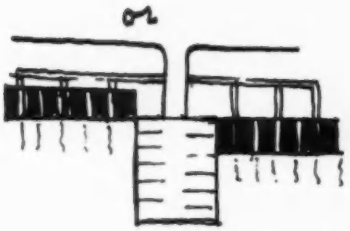


23

11. The more normal answer (22) is not so extreme; it is frequently encountered, but it is a poor solution--the parking bay surrounded by housing units. It is always possible (23) to locate the parking compounds out of the sight lines of the housing units, and the effort is well worth making.

Gardella, Casabella
PROJECT FOR THE C. P. E. "PILOT" RESIDENTIAL DISTRICT AT VICENZA BY THE GARDELLA GROUP
Casabella, revista internazionale di architecttura e urbanistica 230, Pages 23-31. Illustrations.
728.31 (45)

1. In recent issues of EKISTICS, various organizations for row housing have been featured as this is particularly suitable in the development of low-cost housing projects. In the February issue (No. 52) an interesting scheme of housing tor metallurgical workers in Milan, Italy, showed good design in the practical application of row housing in a low-cost project. In the March issue (No. 53), various kinds of layouts for row housing were illustrated and discussed (pages 174-179) and the differentiation of house types for the Korangi Area prepared by Doxiadis Associates showed dependence on a large number of row houses. In the April issue (No. 54), the application of modular construction design to varying kinds of row houses was shown to benefit from technology and still not prove monotonous. In the current issue, the Gardella group provice an interesting concept of using the spaces between rows of housing as pedestrian walks while integrating communal squares within the design of the housing itself.

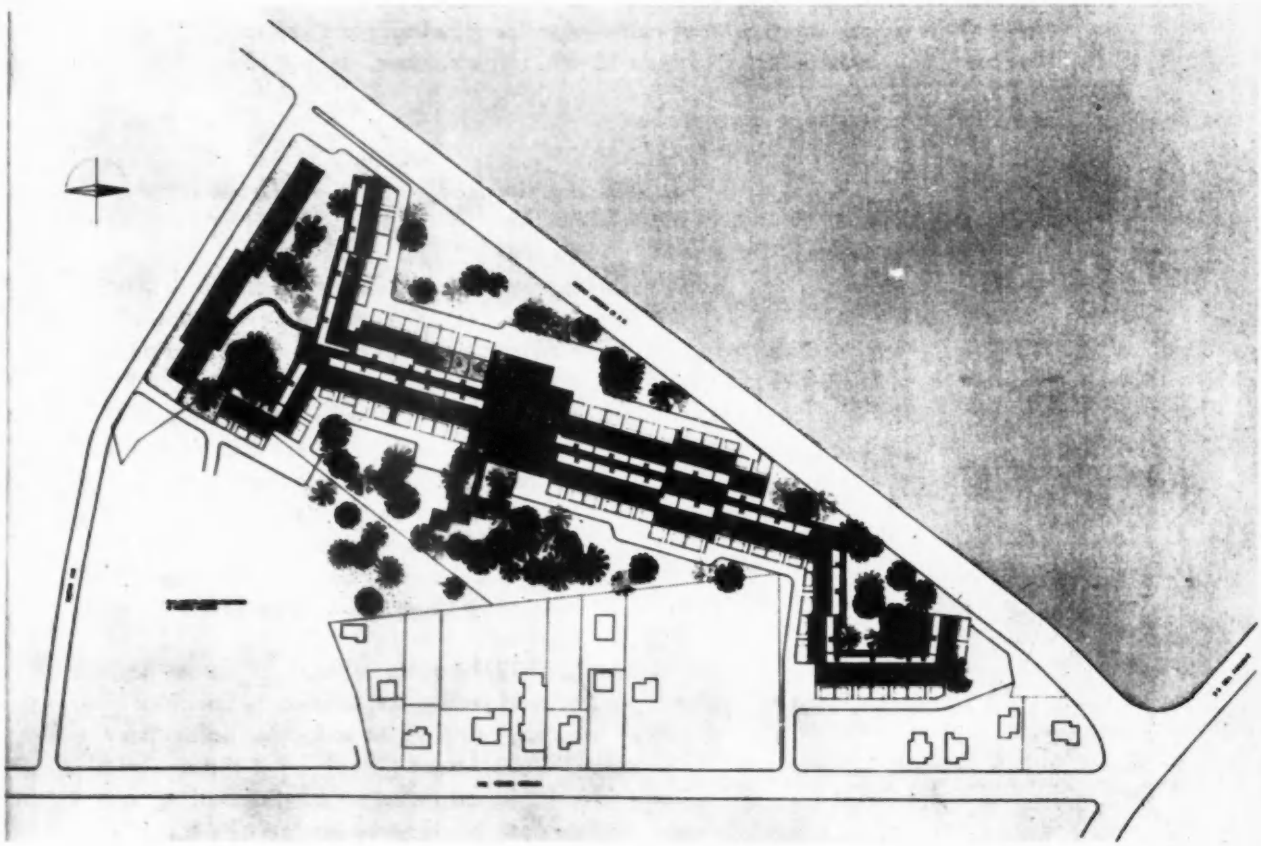
2. The area for a new district, which the Municipality of Vicenze undertook to assign to the "Comitato per Produttivita Edilizia," is on the North-west side of the present urban centre, with 35,000 square meters of land. The district is planned to accommodate large families of white collar workers, for whom the most popular type of dwelling is the row house with a small stretch of land; each dwelling was to have 6 to 7 habitable rooms as houses planned to contain more than one family were considered to make for a smooth life for the entire community.

3. Instead of spreading out the houses over the free areas, they were grouped according to an almost uninterrupted linear scheme, repeating the customary "street structure" and allowing both "neighbouring" and "facing" solutions while avoiding a too-close building pattern. This was developed by planing the entire block on a pedestrian foot path, interrupted halfway along by a small, walled square representing the very heart of the living area; the foot path opens at both ends onto two wide green aprons bounded by the end loops of the curtains of houses. The pedestrian path is limited by the fencing walls of the outdoor areas facing the living spaces of individual dwellings raised about 70 centimeters (2.5 feet); the raised position ensures a certain privacy and allows the view of the green aprons where children can play outdoors safely. The separation between the two rows of houses is wide enough to ensure excellent light conditions for all rooms. All dwellings can be reached from the vehicle raod which runs all round the project.

4. The interior square is limited, on the West side, by six dwellings of craftsmen with shops and on the East side by a building with arcade with four flats on the first floor. Beyond the latter building a stretch of land is used as a public garden. A small two classroom kindergarten will be erected in this park. Along the entire West side of the district a green belt serves as a dividing line from a new large traffic road. From each dwelling it is possible to reach the central square, the kindergarten and any other dwelling of the section, only through pedestrian paths never crossed by traffic roads.

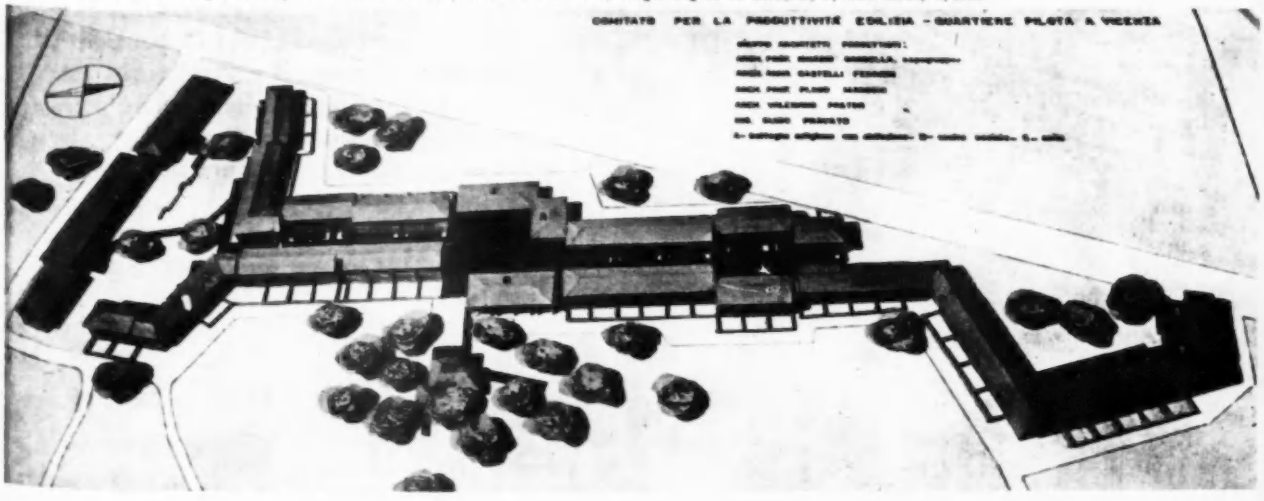
5. In consideration of the city's planning scheme certain dwellings, although having the same number of rooms, were designed differently according to their different layout and location within the section. Even so, the same supporting structure, building elements and finishing materials were used everywhere to reduce total costs. For the same practical reason, structures and materials commonly available on the market have been used, handled in the most economic and technical efficient way.

6. The foundations of the buildings are concrete with supporting masonry, the roofing consists of beams and slabs with tile cover; all outer walls are exposed brickwork. Window and oor frames are wood, flush with the inner walls of the room; shading shutters styled according to the Vicenza tradition. The architectural effect is the result of the different volumes outlining outer spaces, of the changing pattern of proportions, of the use of standard elements, of the single colour scheme of the exposed brickwork, of the fencing walls, of the paving of pedestrian paths. It is stressed by the white paint of window and door frames, by the green shutters, and the sharply cut edgings of sills and cornices.



Quartiere pilota C.P.E. a Vicenza

Sopra: Planimetria generale del quartiere. Sotto: Veduta del plastico. Sono indicate: A, botteghe artigiane con abitazione; B, centro sociale; C, asilo.



Cherniavsky, I.
HOUSING AND DEVELOPMENT IN NEW JERUSALEM
News Sheet of the International Federation for Housing and Planning, Number LIV, January 1960. Pages 16-19. Illustrations.
728.3. 312: 333.322 ( )

1. In this issue, I. Cherniavsky discusses planning and housing within the historic capital city of Israel

2. Historical Development. The New Jerusalem, the bustling capital of the State of Israel with a fast growing population of more than 150,000, burst out from the old walled city barely a 100 years ago. The first attempt at urban construction outside the Old City was made by Sir Moshe Montefiore in 1856 with the founding of Jerusalem's first residential suburb, Yemin Moshe. It grew by leaps and bounds, soon spilling farther and farther from the protective city walls until the New City outgrew the old one both in area and population. The development was characterized by a rather casual land acquisition and construction, without concern for planning or zoning requirements. The older of these New City quarters still maintain a certain charm with narrow streets and heavy masonry houses built around cobblestone courtyards, the austere facades broken by an occasional arched window, and the outdoor stone staircase.

3. The first Town Planning Act for Jerusalem (1921) paved the way for the establishment of suburbs which consisted one-or two-storeyed houses surrounded by spacious gardens. They formed the backbone of the town planning schemes for Jerusalem prepared by the late H Kendall of the Mandatory Government (1944). Yet the declaration of Jerusalem as the State capitol in addition to its functions as an administrative, educational and manufacturing centre made this plan inadequate for the new tasks, and the Town Planning Office under the direction of the late Michael Szwif prepared a new town plan. It was based on a survey of the regional population distribution, conducted by the Planning Division, which called for the settlement of 250,000 in Jerusalem.

4. The new Town Plan divides the town into 15 sections and leaves about 40 per cent of its area open: the hills and plateaus are mainly allocated to housing and general construction development, the steep hillsides and valley bottoms to parks and natural reserves. The cheme calls for a maximum density of 200 persons per acre in the city centre, gradually coming down to 140 persons per acre in the inner rings, and 30 to 10 per acre in the peripheral quarters. The Plan endeavors to retain the special character of the older quarters to convey an appearance of continuity in time. This aim and the blending of the built up areas with their natural environment is further enhanced by the use in the main parts of the town of locally quarried stone.

Part of New Housing Project for New Immigrants in Southern Section of Jerusalem. By courtesy of the Housing Division, Ministry of Labour.

5. Public Housing. The pressure of the influx of new immigrants caused the Ministry of Labour to co-ordinate the housing activities of the Government; private and institutional housing societies; and various land owning bodies. Its main function was to further the implementation of the many housing projects and to organize the financial part through the Treasury, mortgage banks and housing societies. Indirectly it thus stimulated private building which concentrated mainly on higher-priced housing in the garden suburbs. The first to start the construction of public housing after the War of Independence in 1948 was the Jerusalem Municipality which initiated the creation of homes for ex-servicemen in several existing neighbourhoods. The principal housing schemes undertaken during this period comprised: the provision of homes for immigrants and the liquidation of transit camps; homes for war veterans, built by the General Federation of Labour; and popular housing.

6. The technical and financial problems were considerable. The average cost of a flat amounted to I. L. 6000 ($3330), a sum that was quite out of reach for those families who had just come from the Nazi concentration camps and the Displaced Persons camps of Europe. The financial problem was met by the floating of a Government Housing Loan of 50 million Israeli Pounds (23 million dollars), and the mobilization of foreign investment capital. The shortage of finances was reflected in the small size of the flats which generally consisted of 1 and a half to 2 rooms with kitchen and combination bathroom-W.C., totally 48 square metres. A particular feature of the scheme was its allowance for future expansion in accordance with the owner's economic situation, an opportunity of which many of them have availed themselves. Technical difficulties were the shortage of building materials and lack of skilled workers. As time went on, however, local cement, steel and housing fixture factories caught up with the demand and the insufficiency of skilled labour was overcome by on-the-job training and other intensive training courses. The management of the housing blocks was taken over from the Government and the contractors by the National Housing Corporation (Amidar), which leased or sold the flats, and carried out additional development work such as landscaping, road and sidewalk construction, playgrounds, etc. Finally the two transit camps on the outskirts of the town were liquidated, and their inhabitants transferred to permanent housing.

7. Housing for War-veterans. The Israel Federation of Labour has a long-established housing society for its members. Its activities reached their highest intensity during the past ten years by building co-operatively owned apartment blocks in centrally located districts and semi-detached houses on the outskirts. The Federation's houses are mainly of the 2 and a half room (56 sq. meter) type, each set in the midst of a large lawn. Many of the residents have added a third room in accordance with the original plans for a "growing house." The Government has also helped the veterans: up to 1956 they had completed 1,300 flats in Jerusalem. These were mainly in 3- to 4-storey blocks considered to be the most economical and had 3 rooms plus a balcony, totalling about 65-70 sq. meters.

Vagale, L. R.
TRENDS IN HOUSING NEEDS OF INDIA
Urban and Rural Planning Thought, Vol. II, No. 2, April 1959. pp. 50-58.
728.3: 312: 333.322 (540)

1. In the December 1959 EKISTICS (No. 50), V. H. R. Naidu outlined the housing sector of the second five-year plan in India. This month we are presenting an evaluation of future trends of housing which will probably affect India's future economic programmes. This provides an example of the necessary kinds of study and analysis for evaluating the kinds of development programmes which are discussed in two other articles of this issue.

2. Demographic Basis. Planning for housing sufficiency requires a full mastery of the relevant facts and figures about population and its characeristics. In India, however, the problem of estimating housing needs is complex and difficult as the statistical information regarding demography, housing and house-building activity is scarce. Since the First Five Year Plan, some efforts have been made by the Census Commission of the Government of India, the National Buildings Organization, New Delhi, and the Central Statistical Institute, Calcutta, to collect basic data. We still do not have accurate figures regarding:

a. The available residential and non-residential building stock.
b. The number of residential and non-residential buildings constructed each year; number of buildings repaired, reconditioned, demolished, etc., each year.
c. Capital investment in building industry, number of man-hours spent on construction, trends in employment and wages in building trade, cost of building-overheads, quantum of various building materials used and required each year, etc.
d. Number of houses sub-divided into two or more separate dwellings either due to partition of immovable property of joint families or to increase income in case of rental housing.
e. The number of houses in which a room or a portion of the house is sub-let to bachelors or to families without children.
f. Number of dwelling units lost annually to the housing stock on account of conversion of dwellings into shops and commercial outfits.
g. The differentiation between families and households is not clear: the number of 'concealed' families is unknown.
h. In many parts of the country accurate statistics regarding births, marriages and deaths are not available thus we cannot correctly estimate the number of dwellings needed to house these families.

i. Perhaps the greatest deficiency in our demographic data is the total absence of information regarding the number of persons migrating annually from rural to urban areas and their characteristics.

3. Housing Deficit. According to the Census Reports, the urban population in India increased by 10.6 million during the decade 1931-41 and by 18.1 million during 1941-51, while the number of occupied houses in urban areas increased by 1.8 million and 1.7 million, respectively. Obviously, the increase in the number of houses did not keep pace with the increase in population.

4. According to the sample survey conducted by the Government in 1951, there were 12.8 million households in urban areas against 10.3 million occupied houses, which means there were 1.24 households per house. If we aim at a separate dwelling for every household, then, on the basis of the sample survey, the total housing deficit in urban areas was 3.2 million and the corresponding deficit in rural areas was 7.2 million. The gross deficit in housing was a total of 10.4 million. This is only an apparent shortage as no accurate figures are available regarding concealed households. Thus, it is not possible to assess the actual shortage which will obviously be well over 10.4 million.

5. Housing from 1951-1961. If the current trend in urbanisation continues, it is likely that in 1961 the urban population will be about 22 per cent and the rural 78 per cent. The additional number of houses required in urban areas will, therefore, be 6 million, and the corresponding figure for rural areas will be 5.1 million. The additional requirements in housing by 1961 will, therefore, be (3.2 plus 6.0) 9.2 million urban houses and (7.2+5.1) 12.3 million rural houses or a gross total of (9.2+12.3) 21.5 million houses.

6. To this we have to add the number of houses which are likely to be demolished between 1951-1961 due to age, structural deterioration, road widening, etc. Assuming a depreciation rate of 10 per cent, the replacement requirements during 1951-61 will be 1.03 million houses in urban areas and 5.41 million houses in rural areas. Further, slum clearance will necessitate immediate demolition of a large number of urban houses totally unfit for human habitation which are about .51 million dwellings. The total additional requirements for the year 1961 in urban areas amount to 10.7 million, and in rural areas 12.3 million.

7. The Building Prospect. The Second Five Year Plan ending in 1961 envisages the construction of about 1.9 million dwelling units in urban areas. It is doubtful whether this target will be achieved. Even if it is achieved, there will still be a net deficit of 7.2 million houses at the beginning of the Third Plan (1961). Assuming that the additional accommodation required in rural areas for replacement of old houses will be met by the villagers themselves by self-help and other methods, we will still have a deficit of 12.3 million dwelling units in villages.

8. Qualitative Aspect of the Need. Housing is not an end in itself but it is a means to healthy and purposeful living. It is therefore a fallacy to think that the housing problem will be solved by merely building a few million more houses. However, it is very difficult to measure the qualitative aspect of the housing need in terms of types and sizes. The family structure, income and cost of construction or economic rent are the primary factors that determine the size and type of dwellings.

9. Social Aspects of Housing. The evolving of a housing policy requires basic social judgments, linking demography and sociology. We need to consider how people want to live; how they are living at present; what effect the environment has on their lives; the relationship between dwelling types and social characteristics of households; the social groupings of the dwellings, and the dwellings in relation to schools, shops, health and recreational facilities. In many large housing programmes, undertaken in the public as well as the private sector, it is noticed that no serious attempt is made to fit the envelope of the house to the characteristics of the family to be using the accommodation. The Government decides the sizes and types of housing by the pay and status of officials, while in the private sector the speculative builder shows scarcely any consideration of the sizes and needs of families, but tries to play safe by building 'average' houses for 'average' families. The consumer is left with little selection for his particular needs.

10. Conclusions:

a. An accurate estimate of need at national, state and local levels is pre-requisite to formulation of housing policy.
b. Assessment of housing needs should be based on accurate and detailed analysis of demographic data.
c. Estimates based on Sample Surveys, case studies and pilot projects would be more accurate and more revealing than estimates based on demographic figures under present circumstances.
d. The importance of collecting data regarding births, marriages, migrations, and deaths, etc., cannot be overemphasized.
e. Institutions such as the National Building Organisation, Central Statistical Institute, Reserve Bank of India, Planning Commission, Ministry of Works, Housing and Supply, Housing Boards in States, City and Towns, etc., should collect, collate and publish housing statistics in their varied aspects periodically.
f. Social aspects of the housing need should be assessed as much as the qualitative and quantitative needs.
g. An accurate appraisal of housing needs should utlimately lead to the formulation and implementation of a sound housing policy.

Gagnon, Paul
THE BEAVER REPORT
Alaska Rural Development Board, Juneau, Alaska, June 1959. Printed Report.
71 Pages. Illustrations.
711.423: 728.37 (798)

1. This is an abstraction from a factual transcript of a dream that came ture for a village of Indians and Eskimos living on the Yukon River in Northern Alaska. This tells how a number of agencies--State, Federal, and private--cooperated with the people of Beaver in helping them build a new future. Beaver's dream was better housing. Adequate housing to replace the old unsanitary, tumbledown cabins where living was difficult at best. Illustrating the independent spirit of Alaska, the people of Beaver did not ask any governmental agency to come in and build for them. They proposed to build their own houses if only someone would help them with planning and tools. This was done and today Beaver has a new look with neat, well built homes.

2. Area Information and Statistics. The village is on the right banks of the Yukon River about 100 air miles north of Fairbanks. (See map, page 441.) The climate is sub-artic with summer temperatures often reaching 90° and winter lows of 60° to 70° below zero. There is light rainfall and about two feet of snow with more than onehundred clear days per year. The river ice usually breaks in May and the first freeze is in late August or early September.

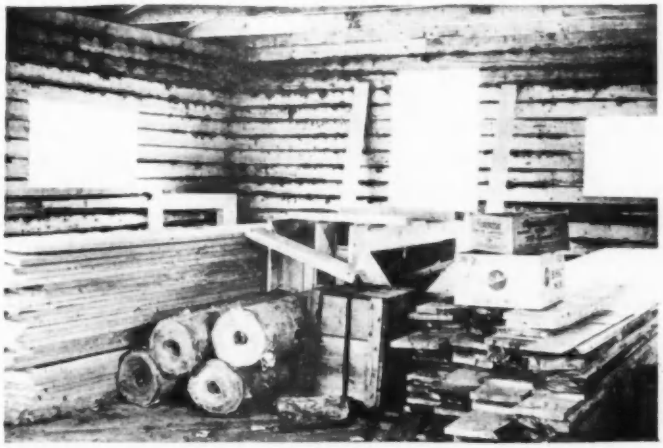
3. In the Alaska Village Census of 1958, Beaver's population was:

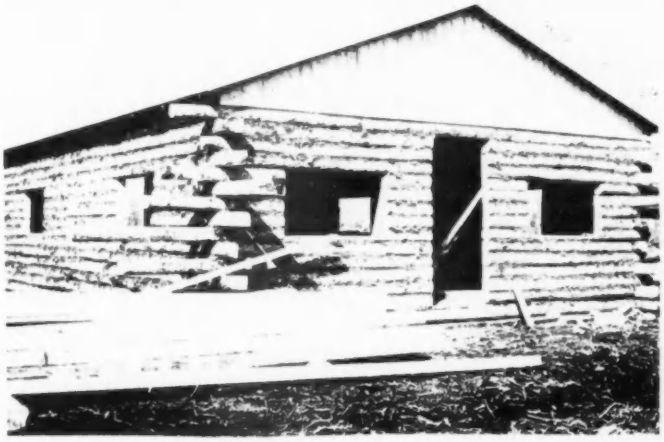
	Male	Female	Total
Total	65	52	117
White	9	4	13
Native	56	48	104

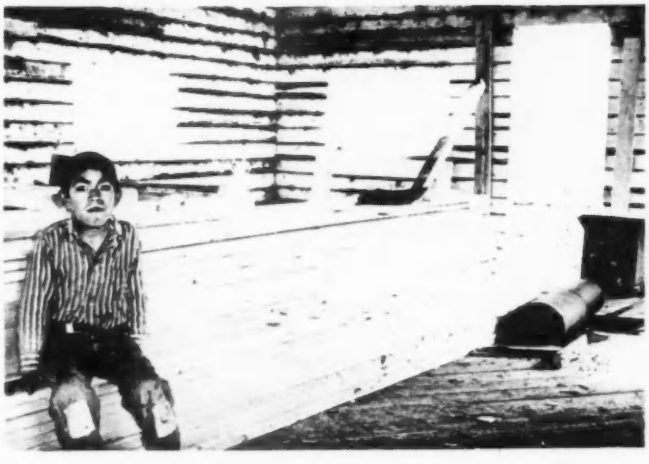
4. The Bureau of Indian Affairs two-classroom school is of frame construction and heated by oil-burning circulating heaters with an enrollment in 1958 of 24. Quarters in the same building for the principal teacher include a living room kitchen, two bedrooms, and a bathroom.

5. The nearest hospital facilities, doctors and dentists area at Fort Yukon and Fairbanks. The Alaska Department of Health's Itinerant Nurse, Margaret A. Clark, visiting Beaver on her regular schedule commented on the new housing, "The larger homes give more room for family activities, and ventilation is better. Windows are more numerous and the homes are constructed to take proper care of the heating apparatus. The appearance of the village is so different and so pleasant. There is still much to be done but where this village had 16 people on medicines for tuberculosis, it is hoped that the rate of relapse might be zero."

CONSTRUCTION VIEWS







It was impossible to completely close in all the buildings during the 1958 season. Before the sawmill and other equipment was moved to Arctic Village in March 1959 each unfinished house was stocked with sufficient lumber to complete the inside work, doors, window frames, windows, building paper for sub floor insulation and ceiling, nails, etc. As soon as the individual owners can complete this work during 1959 the houses will be occupied.

6. Development of the Beaver Project. In the fall of 1956, the Bureau of Indian Affair's Principal Teacher at Beaver, James Sampsell, wrote the Alaska Rural Development Board outlining what was considered to be a threat to the village. The bank of the Yukon was being rapidly eroded and some of the people feared engulfment of the community. In addition, and of greater importance, was the desire of the people to rebuild the village inasmuch as most of the existing cabins were old, damp and unsanitary. The ARDB Director met with the village council to determine how the Board could best assist in a village rehabilitation program. In spite of the progressive attitude of the people, there was much tuberculosis as well as other disease in the village. The type of housing was a great contributor to this high incidence of disease. As an experiment in village rehabilitation and to secure factual data on a pilot project of this kind, the Board voted to loan the village logging equipment and provide some building material to start the project of 14 buildings.

7. The schedule provided new housing for 55 adults and children out of the 117 individuals. Among this group there were 5 widows who were assisted by other available workers. During 1956-57, two tractors, a portable sawmill with 48 inch saw, logging tools, oil, grease, two chain saws, axes and other supplies were brought into Beaver. A total of four men were hired for less than four months to work on the project.

8. At the end of the project, in March and April 1959, the equipment and supplies were freighted overland to Arctic Village--225 miles in 23 days. Arctic Village plans to construct 26 new buildings in a similar project during 1959 and 1960.

9. Construction Notes. The foundation was made of logs laid out in the dimensions of the house which varied from 18' to 35', with widths not exceeding 20'. The longest logs the saw would handle were 22', thus the ceiling joists were limited in lengths and as a result the width of the house was determined. The walls were laid up logs, starting on top of the sub-floor. The doors were always put in the gable ends to avoid drip and icicles from the eaves. Peat moss the traditional material for filling the cracks was dried out and laid on top of each log as the rounds were put up. The rafters were well braced to carry a heavy snow load. Roofing is heavy tar paper over 1" boards. Stove pipes go through inserts of galvanized sheet iron. Roof pitch is five inches per foot on all houses. The windows were fitted permanently in place. A ventilation hole about 10" long was cut in one log near the ceiling with a closing device installed. Windows are all 12" x 48" with four panes.

Regional Centre for Demographic Training and Research in Latin America
STUDIES OF THE ECONOMICALLY ACTIVE POPULATION
United Nations Seminar on Evaluation and Utilization of Population Census Data in Latin America, 30 November-18 December 1959, Santiago, Chile, Mimeographed Paper. 55 pages.
331.96 (72) (8)

1. Statistics on the economically active population are of great value for the elucidation of important aspects of economic and social life and the formulation of measures designed to ensure its improvement. They furnish information on the number of workers available for economic production, classified by branches of activity, trades and professions, juridico-economic status in respect of labour relations, and demographic and cultural characteristics. Consequently, they provide a quantitative and qualitative inventory of human resources from the standpoint of professional or vocational training, geographical distribution and distribution by economic sectors, degree of utilization, sex-age structure, level of education, ethnic origin, place of residence (urban or rural), income, marital status, etc. These data are needed for the preparation of economic and social development programmes, as they enable the most efficient use that can be made of such human resources to be evaluated, as well as the social changes to which the development in question will probably give rise.

2. Labour Supply and Requirements of the Economy. The labour supply may be broadly defined as the potential number of workers available for the production of economic goods and services in a society. The type of production, the technical progress achieved in this respect and the organization of the economy in general affect the size of the labour force. These aspects of economic development are concomitant with the urbanization process, the raising of income levels, the extension and prolongation of school life, labour legislation and the introduction or improvement of social security systems (retirement pensions, etc.), or, in other words, factors through which limitations are imposed on the manpower supply as determined by purely demographic factors.

3. The mere size of the economically active population is not in itself an exact measure of the labour supply, as it does not take into account either the efficiency of the workers or the varying amounts of time which they are prepared to devote to economic activities. The efficiency of manpower is a question of quality, especially as regards health and education. The shortage of skilled personnel (an evaluation on which is given in the following article, pages 451-457) is regarded as an obstacle to the development of many activities in Latin America, particularly at the industrial level.

4. The time devoted to economic activities unquestionably affects the per capita yield. It should be noted that certain groups--especially children, women and old people--generally work for part of the day or during one period of the year. Another

kind of failure to utilize working hours, perhaps more important than the foregoing in the less-developed countries, is that arising from "under-employment." Many workers have to take part-time jobs or accept employment for only a fraction of the year, in default of available natural resources (land) and of capital for the development of production. Under-employment is characteristic of agriculture based on primitive technology, of home industries and of certain kinds of services rendered in large towns by unskilled workers, most of whom are immigrants from rural areas.

5. It might be asserted in theory that the efficiency with which manpower is utilized will improve to the extent that a change in the distribution of employment implies an increase in total productivity; or when the marginal product in certain occupations and industries is greater than in others. But relatively optimum satisfaction of the manpower requirements of the economy would hardly be possible on the basis of the available labour supply without radical readjustments. Some degree of adaptation is brought about through various mechanisms, such as migratory flows, occupational mobility and training of workers. Employment opportunities and manpower absorption capacity in the different areas are not as a rule exactly commensurate with the potential supply generated by the mere vegetative growth of the population. Geographical migration within one and the same country is the instrument whereby the balance between supply and the requirements of economic activity is at least partly restored. (See "The Use of Census Data to Study Factors Affecting Migration" pages 447 and 449.)

6. Geographical migration is only one manifestation of occupational mobility, through which a transfer of agricultural labour to industry and services is brought about. The other aspect of such mobility--as important as the foregoing--is the training of new workers, who are channelled into the various branches of activity proportions different from those formerly observable. Probably the factor exerting the greatest influence on the future short-term trend of the distribution of new workers by activities is the current structure of education.

7. Technological changes, the raising of per capita income and the rechannelling of consumption, which is the latter's logical consequence, bring about modifications in the structure of production and especially in the composition of the labour force. This economic metamorphosis is at the same time a social transformation.

8. Relation Between Economically Active Population and Total Population. The size of the economically active population depends mainly upon the number of persons "of working age." If the age limits concerned are provisionally established as 15 and 64 years, between which the vast majority of workers in any country are included, it will be possible to note the close relation existing between the number of persons in those age groups and the number of economically active persons. In Latin America, round about 1950, the percentage of persons from 15 to 64 years of age varied between 52.5 per cent (Paraguay) and 59.4 per cent (Cuba), with the exclusion of Argentina, where the corresponding proportion is 65.0 per cent. In turn, the proportion of economically active persons (of both

sexes and belonging to any age group) lies between 32.4 per cent (Mexico) and 38.6 per cent (Ecuador). (See Chart, page 447.)

9. In countries where demographic and economic conditions are more highly developed, the proportion of persons of 15 to 64 years of age is seen to be higher than in Latin America. In the United States it was 64.8 per cent in 1950, in Sweden 66.3 per cent in 1950 and in France 67.3 per cent in 1946. In those three countries the proportion of economically active males was 58.1, 65.4, and 67.1 per cent, respectively.

10. Irrespective of the population factors which directly determine age and sex structure, there are economic and social factors which influence the degree to which the population participates in economic activities. Outstanding among these are:

a. extension and prolongation of schooling, to meet the demand for more highly skilled manpower;
b. relative reduction of the rural population;
c. technical progress in production equipment, processes and organization;
d. social and labour legislation (retirement pension schemes, minimum working age, limitation of the working day, etc.)
e. organization of the labour market.

11. In the higher age groups, especially among the population aged over 65 years, participation in economic activities tends to decrease, as in the case of child labour, with the advance of economic and social development. Among the factors accounting for this are the introduction and spread of retirement pension systems and the needs deriving from the increased complexity of the organization of work with respect to efficiency. As examples of Latin American countries where the participation of old people in economic activities is high, mention may be made of Ecuador (86.1 per cent) and El Salvador (82.4 per cent) while it is relatively high in Chile (70.2 per cent) and Colombia (71.8 per cent). In the industrialized countries the corresponding percentages are considerably lower, as in the case of France (54.4 per cent), Sweden (36.1 per cent), the United Kingdom (32.0 per cent) and the United States (41.4 per cent).

12. The importance of the female economically active population depends mainly upon social and cultural factors peculiar to each individual country, which are linked to the role of women in the societies concerned and therefore to the prevailing opinion on female participation in gainful occupations. Broadly speaking, in Latin America the participation of women in economic activities is a good deal lower than in more highly industrialized countries. Exceptions to the rule would seem to be constituted by Bolivia (42.1 per cent), Haiti (53.8 per cent), and Honduras (41.8 per cent).

The explanation probably lies in the fact that most of the population of these three countries is engaged in primitive activities; that is, working conditions are such that within the population of working age there is scarcely any distinction between the male and female labour supply.

13. Trend of Factors Influencing the Relation Between Economically Active Population and Total Population. Attention is drawn to the usefulness of studying trends in respect of the following items:

a. school attendance
b. labour legislation
c. social security legislation
d. economic progress
e. technical progress in various activities
f. urbanization
g. fertility rate
h. the social status of women

Most of the above factors directly influence the degree to which certain segments of the population (children, females, old people) participate in economic activities, while some of them exert an indirect effect through a change in the structure of the economy (economic development).

14. If the proportions of the economically active population are noted in relation to the male population, by age groups (male activity rates), in the urban population and the rural population, two clearly defined and precisely differentiated models are generally found. Changes on the urban and rural "activity rates" are relatively slow, especially in the case of the latter, so that the variations observable in the "activity rates" of the total male population depend chiefly on the change in the composition of that population by town and country dwellers. In this context, it is important to obtain as full a knowledge as possible of trends and probably future changes in the geographical distribution of the population between urban-type and rural areas, and it is obvious that population projections which take this division into account are of inestimable value for the preparation of manpower projections. Table 6 (page 449) presents a comparison of the male "activity rates," by age groups, of the population of the urban and rural areas and the capital city in Chile, Colombia and El Salvador. As a rule the rural rates are definitely higher than those registered for urban areas, which in their turn exceed the rates observable in the capital cities. These differences are particularly marked before 20 years of age and after 65 years. When rural "activity rates" only are taken into consideration, a great similarity may be noted in the age groups between 15 and 64 years, in which the rates in question range from 92.3 to 98.5 per cent, with the exception of the age group 15 to 19 years in Chile, where the rate is relatively low (79.9 per cent). As far as the population aged 65 years and over is concerned, the

Table 1

LATIN AMERICA: RELATION BETWEEN ECONOMICALLY ACTIVE POPULATION AND TOTAL POPULATION a/

Country and year	Both sexes							
	Percentage of inhabitants aged 15 to 64 years	Percentage relation between population aged under 15 years and 65 years or over, and population aged 15 to 64 years	Economically active population as a percentage of total population			Percentage relation of not economically active to economically active population		
			Both sexes	Males	Females	Both sexes	Males	Females
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mexico, 1950	54.8	82.3	32.4	56.8	8.7	208.6	76.1	1 049.4
Costa Rica, 1950	54.2	84.4	34.0	57.6	10.4	194.1	73.6	861.5
Cuba, 1953	59.4	68.4	33.8	57.5	9.0	195.6	74.0	1 008.9
Dominican Republic, 1950	52.6	90.0	38.7	64.9	12.3	258.7	54.1	714.5
El Salvador, 1950	55.8	79.0	35.2	59.3	11.6	184.1	68.6	762.1
Guatemala, 1950	55.3	80.6	34.7	59.8	9.0	188.2	67.2	1 011.1
Haiti, 1950	57.8	73.1	56.4	59.2	53.8	77.3	68.9	85.0
Honduras, 1950	55.5	80.3	47.3	52.8	41.8	111.4	89.4	139.2
Nicaragua, 1950	53.9	85.7	31.2	54.5	8.6	320.3	83.4	1 062.0
Panama, 1950	55.1	81.3	35.1	55.1	14.1	184.9	81.5	609.2
Argentina, 1947	65.0	53.3	40.6	63.4	16.6	146.3	57.7	502.4
Bolivia, 1950	56.1	78.3	50.0	58.1	42.1	100.2	72.0	137.6
Brazil, 1950	55.6	79.6	33.0	56.4	9.6	203.0	77.3	941.7
Chile, 1952	58.4	70.5	36.3	55.5	17.8	175.5	80.2	461.8
Colombia, 1951	54.3	84.1	32.5	54.7	12.4	207.7	82.8	706.5
Ecuador, 1950	54.0	85.2	38.6	55.6	21.7	159.1	79.9	360.8
Paraguay, 1950	52.5	90.4	32.9	51.9	14.7	303.7	92.5	578.4
Venezuela, 1950	55.3	80.6	33.9	55.0	12.2	195.3	81.8	719.7

Source: United Nations, Demographic Yearbook 1955. The economically active population figures for the Dominican Republic and Nicaragua were obtained directly from the census publication, and those for Cuba from the Demographic Yearbook 1955.

a/ Excluding Peru and Uruguay, as no data were available.

level in the three countries does not vary to any great extent (77.0 to 84.2 per cent). In the lowest or under 15 group the differences are more marked, especially in view of the high rate registered in El Salvador. It should be noted that in this last age group the results are not strictly comparable.

15. Urban "activity rates" show wider variations between the various age groups and from one country to another. Nevertheless, between 20 and 64 years of age the levels recorded do not differ greatly (88.7 to 96.3 per cent) except in the case of the age group 55 to 64 years in Chile, where the figure is a good deal lower (82.8 per cent). In the case of the capital cities, the greatest differences in relation to the over-all urban rates (which include the population of the capital) are found in the age group 15 to 19 years, and to a somewhat lesser degree, in the next group (20 to 24 years).

16. Methods of Projecting the Economically Active Population. The basic method which is most often adopted for preparing manpower projections can best be described in terms of the three states it comprises:

a. projection of "activity rates" by age and sex groups;
b. projection of total population by similar age and sex groups;
c. application of the projected "activity rates" to the corresponding figures under b.

17. In the present document reference is made only to the projections of "activity rates," on the assumption that population projections are available. Fundamentally, such projections are based on past trends and on certain hypotheses as to the figures likely to be reached in the not-too-distant future. This type of projection is usually justifiable when it covers a fairly short term (5-10 years). The determinants of the size and structure of the labour force are subject to relatively rapid and unpredictable variations, especially in under-developed countries where a movement towards economic and social progress has begun; this circumstance invalidates the accuracy of the results that might be worked out for a longer period. Again, economic forecasts, for which the manpower projections would have to be utilized, almost always relate to a relatively short space of time. If, for example, the projection covers a period of up to 10 years, the estimated labour force will be made up of persons already born at the time when the forecast is prepared, so that the population projection used is unaffected by any estimate of the future course of the fecundity rate, which is the most uncertain element, at least at national level.

18. To project "activity rates" by age groups several methods can be followed, the choice depending upon the data available or upon the characteristics of the population under study. Unless the contrary is expressly stated, these procedures will be understood as applicable to the male population. The methods referred to are as follows:

Table 6

CHILE, COLOMBIA AND EL SALVADOR: MALE "ACTIVITY RATES", BY AGE GROUPS, IN THE POPULATIONS OF URBAN AND RURAL AREAS AND CAPITAL CITIES (ABOUT 1950)

Age	"Activity rates" (Percentages)								
	Rural population			Urban population			Capital cities		
	Chile	Colombia	El Salvador	Chile	Colombia	El Salvador	Santiago	Bogota	San Salvador
10 to 14 years a/	20.3	19.0	46.4	7.1	12.9	19.7	8.2	15.7	12.9
15 to 19 years	79.9	92.3	94.3	54.7	71.8	78.4	56.4	68.2	68.5
20 to 24 years	96.2	98.0	97.9	88.9	91.4	91.4	86.2	84.9	85.2
25 to 54 years	98.1	98.3	98.5	95.0	96.3	95.3	95.1	96.6	92.7
55 to 64 years	95.0	94.9	96.7	82.8	88.7	93.2	82.2	85.0	88.9
65 years and over	80.4	77.0	84.2	60.7	62.8	79.5	57.1	57.0	71.6 b/
Total a/	85.0	81.7	87.3	78.3	76.2	79.0	79.3	78.1	76.9

a/ Rates for the age group 10 to 14 years are not strictly comparable. In the case of Chile, they are the rates for the population aged 12 to 14 years; in that of Colombia, they represent the economically active population aged 12 to 14 years divided by the population aged 10 to 14 years. Consequently the total rates shown in the last line are not strictly comparable either.

b/ This rate may be greatly affected by accidental variations, in view of the fact that the population belonging to this age group in El Salvador amounts to only 2,008 males.

a. To project the trends in "activity rates" noted in the past;
b. To project the trends in "activity rates" by cohorts noted in the past;
c. To project "activity rates," as indicated in (b), for large groups of activities;
d. To estimate "activity rates" for various population segments (children, females, old people) on the basis of specific hypothese as to public education programmes, retirement pension systems, female labour, etc.;
e. To adjust the future course of "activity rates" to model structures based on the experience of other countries or other parts of the same country.

19. The projection of "activity rates" may follow a method differing from the general procedure described so far. Instead of projecting rates by sex and age segments, the total activity rate is projected (the proportion of the total population represented by the economically active population), and the rates for each age group are subsequently adjusted to the level of the total rate. This method was adopted in a manpower projection for Central America, Panama, and Mexico. The projection in question is based initially on an analysis of the cor-relation between the activity rate for persons--of each sex--aged 10 years and over, and the "industrialization rate" (proportion of the economically active population represented by persons engaged in non-agricultural activities) in the various areas of each country under consideration (states, provinces, etc.). A hypothesis once established as to the "industrialization rate" in 1980, and at intervening dates, the corresponding regression equation provides estimates of the total "activity rate" in the time interval in question. When the total "activity rate" has been projected by this method, a first approximate calculation of the rates by age group is made, by applying to the total rate the same proportions as existed in 1950. Lastly, the rates for some age groups (10-14, 15-19, and 65 years and over) are adjusted on the basis of certain assumptions as to school attendance and of trends in other countries, or by postulation, that over-all "activity rates" (urban and rural population) will be the same in 1980 as the 1950 urban rates.

20. Some Major Topics on Which Research Could Usefully Be Conducted.

a. Evolution of the structure of the economically active population.
b. Studies on occupational mobility.
c. Table of working life.
d. Evaluation of labour supply in relation to training programmes.
e. Female employment.
f. Under-employment.
g. Studies of socio-economic groups.
h. Studies on dependents (not economically active persons).

International Labour Organization
TECHNICAL AND SCIENTIFIC PERSONNEL: METHODS OF ASSESSING SUPPLY AND DEMAND.
International Labour Review, Vol. LXXXI, No. 1, January 1960. Pages 58-73.
331.96 (100)

1. For a number of years shortages of scientific and technical personnel have given rise to concern in many countries. However, lack of reliable and sufficiently detailed information has often made it difficult to assess the dimensions of the problem and decide how it should be tackled. Moreover, efforts to increase the supply of scientific and technical graduates cannot be expected to bear fruit in the short term. The period of training required is too long, existing training facilities have to be expanded and enough students attracted to enroll in appropriate courses; all of which takes time. Hence, it is not present demand but demand several years ahead that has to be assessed as a basis for realistic planning. Such long-range forecasts, however, are extremely difficult to make because of uncertainty regarding economic growth and the lack of certain basic statistics. Although past studies have been useful as a starting point, more reliable methods of forecasting would be highly desirable. During the past year EKISTICS has reviewed both the problems of development which bring out this inadequacy of trained personnel: G. Neil Jenkin's, "Food Health and Population--A World Planning Problem" and Kathleen McLaughlin's, " Sheep Getting New Lease on Life" both in the February issue (No. 52), and reports of schools and seminars to help train personnel such as The Athens Technological Institute, "Training in Ekistics," August 1959 (No. 46). This month EKISTICS abstracts the following analysis of the problems involved and of the attempts actually made in various countries to assess supply and demand.

2. Information on Supply. In assessing the probable supply of scientific and trained personnel the problem is the analysis of the existing stock, of additions to this stock, and losses from it. The existing stock includes all qualified persons capable of working in the occupations concerned. But a first distinction must be made between those who are actually at work or looking for work in these occupations and those who are not. The former category should be further broken down into the employed, the self-employed and the unemployed. The latter covers two main groups: (1) those who are at work in other occupations; and (2) those who are outside the labour force (e.g., retired people and married women not employed). Both these latter groups constitute a potential source of supply which might be attracted back to scientific and technical occupations, for example if different conditions of work and pay were offered; but it is difficult to assess their importance in this respect.

3. Additions to stock consist mainly of graduates from educational institutions, immigrants and persons transferring from other occupations. Graduation is by far the most important source of supply. It is important to find out the specialization

of the graduates and how many do not take or find employment in their own occupation and why. Immigration makes only a very small contribution in the industrialized countries but it may play an essential part in the less developed regions of countries.

4. The main causes of loss from stock are death and retirement, transfers to other occupations, withdrawal of women and emigration. Death and retirement account for the largest numbers. Transfers are less important except in the tendency for workers in technical occupations, such as engineers to transfer to administrative or management posts.

5. Information on Demand. Information on demand must be as comprehensive as possible for each of the occupations involved. For example, an estimate of the need for chemists based on the chemical industry alone would greatly understate total demand, since chemists are also needed in many other industries. Sufficient details should also be obtained on the fields of specialization in which personnel is required.

6. Knowledge of current demand is of direct use in bringing existing shortages to light; at the same time it provides the basis for the assessment of future demand, for which account must also be taken of normal replacement needs as well as estimated new requirements following economic or industrial expansion, technological change, the growth of new industries, the development of research or educational programmes, etc. Such estimates of expanded requirements are highly subjective. However, even information on current demand is not always reliable; for example, if a shortage has prevailed for some time employers may have become used to getting along with less than the optimum number of scientific or technical workers. On the other hand, in countries where technicians have been in very short supply, engineers have often been used for technicians' work, with the result that the number of engineers required for engineers' work may have been overestimated and insufficient attention given to the shortage of technicians.

7. Scope of Inquiries. First, the specific occupations concerned must be clearly identified. Assumptions should not be made of general feelings about certain occupations that are suffering shortages. While the inclusion of such occupations is warranted, this method gives no assurance that all actual and potential shortage occupations have been covered. Equally important is the need to explore the situation in supporting occupations (e.g., technicians who might be used to replace higher scientific and technical personnel) and in closely related managerial and organizational occupations.

8. Many surveys fail to provide exact definitions of the titles of the occupations covered, interpretation being left to the persons responding to the inquiry; the resulting statistical data are necessarily misleading. For example, in the 1950 census of the United States a large number of young men with little or no college training reported themselves as engineers, whereas the 1940 census had specifically excluded from the category any

person under 35 who had completed less than four years of college training. In Austria the only basis for an estimation of the existing inventory of engineers was the census of 1951, but the technical categories in question included many chemists, physicists and other graduates, and an estimate had therefore to be made of the number of persons to be deducted from the total in the technical occupations.

9. General figures on supply and demand in each of the main scientific and technical occupations are not very meaningful unless information is also obtained regarding the functions (i.e., operational, research, planning or teaching) performed by the persons concerned. In certain posts the same person may fulfill two or more functions, which in itself is a useful element of information. Moreover, particularly when getting information from employers, qualitative information can be very useful in the interpretation of the figures obtained and may even help to point to underlying problems. In Belgium, for example, an inquiry based on personal contacts was carried out at the same time as a questionnaire was addressed to employers on their expected requirements for scientific and trained personnel. In the course of this inquiry employers were asked about their opinion of the vocational training system, the probable technical evolution in the sector concerned and its repercussions on needs for training and research centres, their criteria for the recruitment of qualified personnel, and their employment policies, present and future.

10. Sources of Information. The principal indicators of supply and demand are:

a. Census
b. Membership Rolls of Professional Societies.
c. Educational Institutions.
d. Surveys among Employers.

As the data from the first three are relatively straightforward, the potential information obtainable from surveys among employers will be the only category abstracted at length.

11. Surveys among employers have been widely used to obtain data not only on the present distribution of technical and scientific personnel in the economy but also on employers' views regarding their future requirements for such personnel. This information is often included in periodic reports supplied by employers to a manpower agency carrying out regular establishment inquiries. In many countries special surveys of a more or less elaborate nature have also been undertaken. These surveys have certain advantages:

a. Surveys can be made at fairly frequent intervals and information kept up to date;

b. Sampling methods can be used;

c. Some of the questions about the proper occupational classification of individuals can be resolved on the basis of the employer's estimate of an individual's qualifications and the actual work to which he is assigned;
d. The response is usually satisfactory if they are accompanied by a well organized publicity and information programme or when they form part of a regular reporting programme.

12. Some employer surveys have been specifically aimed at obtaining information about the supply of scientific and technical personnel. The aim of other surveys has been to ascertain the ratio of personnel in certain technical or scientific occupations to total employment in the industries concerned. For example, a pilot survey carried out by the United States Bureau of Employment Security at the request of the National Science Foundation and the President's Committee on Scientists and Engineers, concerning the manpower situation in selected engineering and scientific occupations in the chemical industry, aimed among other things at finding out the ratio of employment in the occupations concerned to total employment in the establishments surveyed, and the percentage of chemists and chemical engineers to total engineering and scientific employment. In the same country a comprehensive survey was undertaken by a publishing firm by means of a questionnaire addressed to some 5,000 undertakings in order to determine, for each industry, average percentages of personnel in different occupational groups in relation to the total number of workers employed. The data were analysed according to plant size and broad type of work (production, plant operating, maintenance and plant engineering, and non-operating employees). Although these averages represent neither good nor bad distribution practice and cannot be interpreted as optimum, they do reflect differences in practice according to plant size and from industry to industry.

13. In certain countries efforts have been made to overcome these difficulties and to obtain from employers as reliable data as possible regarding their future requirements for periods ranging up to ten years. In Belgium a very comprehensive sample survey was carried out to assess present employment of scientists and technical personnel in the private and public sectors and in scientific research, as well as requirements five and ten years from now, in order to decide what should be done to adapt the output of educational institutions. Since preliminary contacts with employers had shown that they often had preconceived ideas that were not based on the facts, an effort was made to avoid subjective replies by drawing up the questionnaires in an extremely analytical manner. Although reactions to the resulting rather voluminous questionnaire were often unfavourable, in particular because it obliged employers to make a thorough examination of all the problems raised, it is believed that the method adopted made it possible to assess needs more realistically.

14. A rather different approach was used in a survey conducted in India by the Engineering Personnel Committee to estimate the demand for and supply of engineering personnel in connection with the Second Five-Year Plan (starting March 1956). The study was based

on information supplied in response to a questionnaire addressed to public agencies and private undertakings. However, the estimates of demand in the public sector were largely made on the basis of the cost involved in the various schemes to be executed under the Plan. For this purpose ratios were worked out between cost involved and engineering personnel required in road building, construction of buildings, irrigation projects, etc. These ratios were expected to help the states in estimating their personnel requirements; but on the basis of data submitted by certain states they had to be modified for various regions of India. In the private sector the information collected gave no hint of the number of engineering personnel needed to achieve the targets set in the Plan. In order to assess needs additional data had to be obtained from the Ministry of Commerce and Industry, where the development officers had, in the course of their work, gained considerable insight into the relation between personnel requirements and expansion of production in various branches.

15. On the whole, therefore, although some interesting experiments have been made with employer surveys as a means of ascertaining the long-term demand for scientific and technical personnel, the results are not altogether conclusive. Problems arise in framing questionnaires that are not too complicated, yet will elicit replies that are objective and sufficiently representative and will yield comparable information, etc. Trial runs make it easier to draft a satisfactory final questionnaire, while personal contacts with employers make it possible to supplement the information obtained and to interpret it realistically. Moreover, in the light of experience, difficulties regarding the definitions of the categories investigated or due to the lack of basic statistics can probably be eliminated. Nevertheless, the subjective nature of the replies received, combined with the uncertainty of future developments and of their effects on manpower requirements in various occupations, will continue to be the main weakness of this method of investigating the future demand for scientific and technical personnel.

16. No attempt will be made here to enumerate--far less to discuss--all the other sources of information which may supplement data about manpower supply derived by more direct methods. These include:

a. National Roster in which all people making up the supply would be registered;
b. Public employment service;
c. Salary trends in various fields (as an indicator of a supply-demand relationship);
d. Licensing authorities for occupations;
e. Budgetary provisions (private and public) for scientific research and development work;
f. Income tax returns;
g. Social insurance records;
h. Registration for military service.

17. Forecasting Methods. The sources of information known at present yield satisfactory data on the current situation and short-term trends, but are not very reliable on long-term trends. Various approaches have been used in forecasting replacement needs resulting from death and retirement, the major ones are:

a. Separate calculation of death and retirement rates;
b. Death and retirement rates estimated from an assumed average length of working life; and
c. Death and retirement rates calculated from actual experience.

18. Projections of university enrollments in various fields of study have been made by the education authorities in many countries. Broadly speaking such projections have three components: the first is a projection of the population by age through the age ranges at which people normally attend schools. The second component is the trend in the proportion of the total population of each age enrolled in each type of educational institution (See April EKISTICS, HIB-GA 54, Vol. 9). In many countries this proportion has risen in the past, as a result both of the voluntary decisions of young people and their parents and of government policies (school attendance laws, etc.), school policies (admission standards, etc.) and policies of industry with respect to educational requirements for employment. Study of past trends makes it possible to form an opinion on how the various factors will operate in the future. The third component is the trend in the proportion of students choosing each field of study. Analysis of this trend leads to estimates as to future choices.

19. With few exceptions attempts made over the last few years to forecast demand for scientific and technical personnel have followed a simple approach; this is justified by the immediate need for projections and by the lack of basic statistical data for more comprehensive studies. Good statistical services to provide such data in future are therefore an essential prerequisite. In some of the studies past rates of growth in scientific and technical employment have been projected into the future, while in others employment has been related to the level of economic activity (measured in terms of production, total employments, costs, etc.). Major considerations in the choice of method are the availability of data for past years and the question whether past development has been steady enough to warrant its use as a basis for projections.

20. Conclusions. In the first place, the techniques used in evaluating the situation and the trends are largely dependent upon the avabilability of a certain minimum of basic economic, demographic and labour statistics. Birth and death rates, working life tables by sex, labour force participation rates, patterns of occupational distribution by industry, registers identifying employing establishments by industry and size, data on the enrollment capacity of education and training institutions at all levels, production and productivity figures--these are only some of the typical sources of data, largely statistical in nature, which are drawn upon in making estimates of present and anticipated manpower

supply and demand. Countries which have yet to develop minimum basic statistical services are therefore handicapped in measuring their manpower resources and requirements.

21. Because comprehensive data of the type required are a composite derived from many sources by a number of specialized organizations, both public and private, it is important that such inquiries should be directed and co-ordinated at a sufficiently high level. Few, if any, of the specialized organizations which contribute part of the data can have a grasp of the entire administrative process.

22. This means that some government department must assume responsibility for determining what occupations are essential for planning and development, and for deciding which organizations (public and private) can make an essential contribution to the calculation of manpower supply and demand. At the same time it must develop the basic statistical services. The contributing organizations will need administrative direction and assistance to ensure the regularity, continuity and technical consistency of their programmes, and they will have to be given methods and procedures. Central responsibility makes it possible to compare actual data on supply and demand with forecasts; it facilitates studies of technological changes in work processes affecting numbers and types of occupations that are best investigated on a country-wide basis. It is only at the level of a government department that scientific and technical personnel can be assessed in the light of the national employment market as a whole and that the data on the supply and demand in this small but highly important segment of the labour force can be reviewed in true perspective.

United Nations Economic Commission for Africa
PROBLEMS CONCERNING TECHNIQUES OF DEVELOPMENT PROGRAMMING IN AFRICAN COUNTRIES
Prepared by an Expert Group of Economists for Meeting on Development Programming, Addis Ababa, November 30, 1959. Mimeographed Paper. 111 pages.
338.984 (6)

1. Recently pilot meetings have been held in Asia and Africa dealing with programming techniques. As the developing countries and the developed countries, alike, are becoming more complex with evolving technology, the need for sophisticated programming encompassing physical, economic, and social planning is being felt. These meetings are being held to help countries to develop techniques to further and control their development. The conference held in Addis Ababa for the African nations pointed out the needs for programming and some of the areas in which help and direction can be provided. The following abstraction instances certain specific economic models and techniques which should be used in programming.

2. A development programme is an analysis which provides a basis for designing and carrying out a development policy by reference to objective criteria and for testing its implications against those of alternative policies. The essential components of a development programme are the following:

(a) A statement of the general aims and objectives of the government.
(b) A statement of more precise and quantitative targets.
(c) A statement of the structure of the economy, recent trends, and broad lines of development.
(d) Balance sheets and tests of feasibility.
(e) A public expenditure programme.
(f) Details of major projects.
(g) Explanation of policies and measures by which the government proposes to achieve its aims.

3. General Aims and Objectives. Among possible objectives--all of them of importance in Africa--are the following: To reduce mass poverty and malnutrition--to change over from a subsistence economy to a monetary economy--to achieve a higher degree of export diversification--to encourage agriculture, etc. It will be readily seen that not all these objectives are consistent and may compete for limited resources. It is important to say what exactly the government has in mind.

4. Targets. Targets can be "over-all" or "sectoral." Among over-all targets, which are frequently included in development programmes, we find national income targets, consumption or standard of living targets, investment targets, targets for total employment or changes in employment structure, export and import targets.

An over-all target of this kind can be in the nature of a task to be set, or it can be in the nature of a trend to be projected. Where a development programme establishes over-all targets for national income, consumption, investment and imports, it is best to set out these targets in the form of at least an elementary national accounting system. In this way the internal consistency of the various targets can be tested, such as assumed relationship between increase in income and increase in imports, the assumed ratio of investment, etc. In a development programme, covering, say, five years, the over-all targets could be set either for the five year period as a whole or year by year, however, not too much importance should be attributed to yearly achievements in a situation where there are fluctuating markets and prices.

5. Apart from fully aggregative targets, development programmes normally include targets for the major sectors of economic activity. The relationships between the over-all targets and the sector targets can be of two kinds: either the sector targets are derived from the over-all targets (this is known as the "programming approach"); or the over-all targets are built up from the sector targets (the "sector approach"). The pure "programming approach" presupposes greater knowledge of the total economy and relationship of all of its sectors than the under-developed countries--or indeed most other countries--can possess, while the pure "sector approach" is wasteful. In practice, therefore, the relationship between sector targets and over-all targets is bound to be a mutual one. Development programming essentially consists of a process of mutual adjustment, back and forth, of sector and over-all targets to each other.

6. It is important to distinguish between targets in the public sector and targets in the private sector. The former are the direct responsibility of the government and they should, therefore, be in the nature of firm undertakings, subject only to the normal revisions of the development programme. Targets in the private sector are no more than what the government expects to happen; or would like to happen or will try to make happen by its economic policies. Private targets state the assumptions on which the government proceeds in framing its public expenditure programme.

7. Among the public sectors, the more social sectors, such as health and education, are in a special class. A number of recent investigations have pointed out that of the total increase in productivity per man hour only a minor part has been due to the increased input of capital and natural resources per worker; the major part has been due to an increase in output per unit of capital and natural resources used as well as per unit of labour. This strongly points to the importance of "human investment" as factors in increasing output. The relationship between health and education is different in that its output is different than other forms of investment in the following ways:

(a) health and education are by themselves desirable development objectives
(b) the relationship between health and education and output is unpredictable

(c) the relationship is not technological but a matter of general economic and social analysis

(d) there is usually no market demand as a guide to the volume of education and health services needed.

8. Structure of the Economy and General Lines of Development. The presentation of a picture of the economy and its broad trends in the recent past, and as pictured in the development programme, is desirable for the following reasons:

(a) A description of the structure of the economy, preferably in the form of a national accounting system, indicates the presently available resources, and the use presently made of them.

(b) A projection of recent trends, modified by predictable changes in them, indicates what is likely to happen in the absence of specific new development efforts and government measures providing a basis for judging whether the objectives are realistic, and whether the government measures and policies proposed seem adequate to attain them.

(c) The period selected for a development programme is not a self-contained isolated segment of time: it is part of a continuous process in the economic growth, or at any rate in the economic history of the country concerned.

(d) A picture of the expected broad changes in the economy under the impact of the development programme helps to understand the purposes and priorities of the programme.

9. Balance Sheets and Feasibility Tests. The first such test relates to the overall feasibility of the programme as a whole. The claims of the developmental effort, added to other claims, must not exceed the resources that can be made available during the planning period. For performing this test, some elementary national income frame-work is indispensable. Then, if the development programme seems to be excessive in relation to total available resources, one of the following things will have to be done: private consumption will have to be cut, either by promoting savings or by taxation; or normal government consumption will have to be cut: perhaps defense expenditure, or the number of civil servants will have to be reduced; or non-developmental investment, public or private will have to be reduced; or foreign exchange reserves will have to be drawn down, or foreign investment will have to be attracted; or foreign aid will have to be invoked.

10. The second test, must be the balance of payments test--the test of foreign exchange resources. The foreign exchange budget must take into account:

(a) Present state of balance of payments and foreign exchange reserves.
(b) Additional direct demand for imports arising from the public and private investment of the development programme.
(c) Indirect additional demand for imports arising from the increase in incomes as a result of successful development.
(d) Additional demand for imports arising from a transformation of a subsistence economy into a money economy, from the spreading of education and knowledge of the world in general, and from increasing economic contacts.
(e) Additional demand for imports arising from the fact that a higher level of economic activity generally requires larger stocks of goods and larger imports of raw materials and semi-finished goods.
(f) Additional demand for imports which may arise from a generally inflationary impact of the development programme.

As against this additional demand for imports arising from various sources, there is to be set in a development programme the reduction in the demand for imports, arising from the fact that a number of the development projects will be designed to produce commodities which were previously imported. Apart from export and import of commodities, the balance of payments test of a development programme must also make allowance for non-commodity items in the balance of payments. As exports and imports increase, associated costs of transport and insurance will increase. Increased foreign investments in the past, as well as foreign loans received in the past will be reflected in higher outgoings of foreign exchange, in order to provide for payment of interest, dividends and repayment of capital.

11. What happens if a development programme does not pass the foreign exchange test? Several possibilities exist:

(a) The programme may be cut down and made less ambitious.
(b) The government may take measures to restrict imports.
(c) The development programme may be revised so as to give greater emphasis to import substitution.
(d) Export promotion may be more strongly emphasized in the revised programme.
(e) The currency of the country may be devalued.

12. A third limitation general to African countries, apart from total resources and foreign exchange resources, is a specific shortage of capital in relation to unskilled labour, and, in many parts of Africa, also in relation to land.

13. Food supply--or more generally, agricultural output and productivity--are the object of another essential test of feasibility. The increase in industrial and other non-agricultural employment associated with a development programme requires increased food supplies from a relatively smaller number of people; it requires the development of agricultural raw materials; it requires the development of agricultural exports in order to pay for the capital goods and indirect additional imports required. Superimposed upon all this is the desire to raise the standard of living of the agricultural population itself, which forms the majority in Africa. If agricultural productivity fails to rise to required degree, the whole interrelated system will come crashing down. Failure to meet this test has been the rock against which many a development programme has foundered.

14. Fiscal feasibility is another important test. In determining the pattern of development expenditure, it must be realised that as development proceeds, current expenditures tend to increase and an increasing portion of future revenue has to be earmarked to meet them. The fiscal feasibility test lies precisely in checking the future availability of current revenue against the needs of growing current expenditures, accounts being taken of the expected need for budgetary savings.

15. Public Expenditure Programmes. Economic development programming sets the public expenditure programme within the context of the economy as a whole. It relates the proper way of financing public expenditures on the financing of private investment interested in economic development. It indicates that the benefits of public investment are not measured by the production directly arising in the public sector, and even less by the public revenue to which they give rise. Instead, they are measured by the total increase of production made possible as a result of public investment whether this increase in production accrues in the private sector or the public sector. The financing of public and private investment must be seen as a whole: private savings should be considered for public investment and public moneys may be channeled into private investments.

16. Individual Projects. It is obviously necessary in a development programme, to come down to concrete projects. In selecting projects, the technique of development programming leads to emphasis in the following directions:

(a) Projects are looked for which have a strong "impact effect" in utilizing otherwise unemployed resources.

(b) Projects which relieve a particular bottleneck or source of weakness in the economy.

(c) Projects which are related to other projects in a "complementary fashion.

(d) Projects which "diversify" the economy, i.e., which introduce or strengthen a line of production or economic activity previously not represented or under-represented in the economy.

17. Policies and Measures to Implement the Programme. The purpose of a development programme is not to produce an impressive or even an intellectually satisfactory document. The purpose is to get things done, to change things. Therefore, the means towards this end are as important as the end itself. Although it is necessary to show that the objectives of a development programme are capable of achievement, the specific policies and measures to be applied may not be published at the same time and in the same document as the programme itself.

18. Implementation of Development Programmes. Among the problems of implementing development programmes we may perhaps single out for fruitful discussion the following:

(a) Continuity in development programming. In democratic countries, governments change as well as views and objectives of the people. Hence, a development programme should never be immutable; and this is true even more of short-term policies. The solution has been to try to "take the programme out of party politics." Continuity is perhaps best safeguarded if the group of officials executing the development programme establishes a high reputation for efficiency and impartiality, if it establishes good cooperation with the various government departments which formulate projects and carry out policies, if it is recognized by government departments as helping them with their jobs rather than obstructing them, and if the development programme is successful in marshalling enthusiasm and support from the population.

(b) Revision of development programmes. The necessity of constant evaluating and revision of short-term policies and the effectiveness of different policy instruments arises from the fact that the various proposals and parts of a development programme form an interrelated whole: if one sector of the development programme deviates from its role the other factors need adjustment.

(c) Administrative location of the programming group. The general spirit of development programming would seem to point in the direction of the staff work being under the direction of a Cabinet Minister, and of the group being directly attached to the Prime Minister's Office.

(d) Coordination in carrying out the development programme depends on good administration and programming.

(e) Efficiency of public investment programme within the framework of a development programme. This depends vitally upon the efficient running of those public services and enterprises which are established or extended as part of the programme.

United Nations Economic Commission for Asia and the Far East
PROGRAMMING TECHNIQUES FOR ECONOMIC DEVELOPMENT WITH SPECIAL REFERENCE TO ASIA AND THE FAR EAST
Report of the First Group of Experts on Programming Techniques, 16th Session Economic Commission for Asia and the Far East, 17-29 February 1960, Karachi, Pakistan. Mimeographed Paper. 151 pages.
338.984 (5)

1. This report is from the Asian Pilot meeting on the techniques of programming economic development. It was prepared by a group of five experts who were appointed to consider specific aspects of the techniques of programming economic development. It represents the unanimous views of its authors who acted in their personal capacities and whose recommendations are put forward on their own responsibilities. The groups was composed of the following:

Mr. Gamani Corea, Secretary to the National Planning Council and Director of the Planning Secretariat, of the Government of Ceylon

Mr. Dwarkanant Ghosh, Chairman of the Programmes Evaluation Organization of the Planning Commission, the Government of India

Mr. Benjamin Higgins, Professor Economics and Chairman of the Department of Economics, University of Texas

Mr. Shinichi Ichimura, Assistant Professor at the Institute of Social and Economic Research, Osaka University

Mr. Jan Tinbergen, Professor at the Netherlands School of Economics, Rotterdam.

2. As this is both a long and detailed report suggesting specific technical models, only the recommendations made by the group is presented in EKISTICS. The discussions in the main body of the paper included the following:

a. Planning the General Rate of Development
b. Planning the Development of the Main Sectors
c. Integration of a Programme of Projects into an Investment Plan
d. Planning the Development of a Large Number of Sectors
e. Planning the Development of Different Regions
f. Planning the Short-term Adjustments to External Disturbances
g. Planning Manpower, Education and Income Distribution

3. RECOMMENDATIONS: The Use of Models for the Region. The use of econometric models presupposes the availability of quantitative information about the variables,

coefficients and parameters, which are used to construct them. The range and variety of the information required, of course, varies with the complexity of the model. Broadly speaking, one can divide the countries of the region into three groups according to the stage of development of their statistics which can use models of various complexity. While the use of all models implies the availability of quantitative data, the simpler models can be tried out with approximate data and with the help of the known values of coefficients in other countries. Examples of countries in the ECAFE region which fall into this group are Afghanistan and Nepal. The results may not be fully satisfactory at this level; but they will probably offer better guidance than pure guesswork or intuition. Moreover, the attempt to construct a model and use it may orient the planners of a country toward scientific planning and lead to the development of useful statistical data.

4. Dissemination of Knowledge. The recommendations within the field of programming techniques first refers essentially to the wider dissemination of knowledge concerning programming techniques and models amongst planning agencies and similar bodies. To do this it is recommended that both a handbook be prepared and training courses set up.

a. The Handbook: It is suggested that the ECAFE arrange for the preparation and publication of a Handbook on Development Programming for the use of planning agencies in the Region. The handbook should provide practical guidance on the techniques to be used in dealing with the problems of planning in particular, on the central problem of interdependency. It should be written for the economists, statisticians, econometricians and other specialists concerned with planning, and should provide information about the simpler as well as the more complex methods that could be used.

b. Training Courses: A trained staff is of the greatest importance in the application of programming techniques. The existing facilities for training are, however, extremely limited and almost exclusively outside the region. To meet this situation courses of training in planning work should be provided within the region for members of the staff of planning departments or related governmental agencies. This course should be provided every year with a duration of about 6 months. It should familiarize trainees with the techniques of programming and their application, with the development plans of various countries, with problems of implementation, and with questions relating to planning machinery. The courses which should be sponsored by ECAFE should draw their experts from both without and within the region and from academic institutions and planning bodies.

5. In addition, the dissemination of knowledge should be furthered through the improvement of data and techniques. Certain types of work in this category could be undertaken by future Expert Groups. Other types of work, however, may be more

appropriately handled by international institutions with facilities for continuing research. The following subjects are recommended as high priority for work of future Expert Groups:

a. Cost data: The importance of cost data on various industries for efficient programming is important. A future Expert Group may usefully appraise the data already available and consider the design of research needed for their improvement.

b. International comparisons of coefficients: The design of research by a future Expert Group for the analysis of data on coefficients, for example consumption and investment functions, capital coefficients, input coefficients, labour productivity, etc., are of great value for planning purposes.

c. Shadow prices and choice of technology: There is scope for further study in this field concerning the concept itself, the determining of shadow prices in practice, and the usefulness of these and other concepts in the choice of technology.

6. Of the subjects and tasks that could be dealt with by international institutions, or in other ways, the following should be given priority:

a. Forecasts of world demand for major commodities.

b. Case studies in the application of programming techniques: It will be of considerable use both for illustrative and experimental purposes to apply various programming techniques and growth models to the actual situation of specific countries in the Region. It is suggested, therefore, that ECAFE should seek the co-operation of member governments for such a project and arrange in the first instance for a suitable team to visit a particular country in order to undertake such a study.

c. Intraregional co-operation in planning: It is suggested that ECAFE should explore the possibility of assisting in intraregional co-operative planning. ECAFE might also, with advantage undertake the preparation of long-term projections of growth as well as other studies of relevance to intra-regional co-operation.

d. "Learning Curves": These throw light on the relationship between changes in production and change in the average productivity of labour in respect of the economy as a whole, or individual sectors, and even single projects. The collection and analysis of data on learning curves in different parts of the world would be of value as an aid to development programming. A study of this subject might well be undertaken by the ECAFE Secretariat.

7. In addition to the recommendations outlined above, this group is of the opinion that in view of the great importance of agriculture in the ECAFE region that a regional meeting of experts to be jointly sponsored by ECAFE and FAO on the problems of target setting in agriculture be held.

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